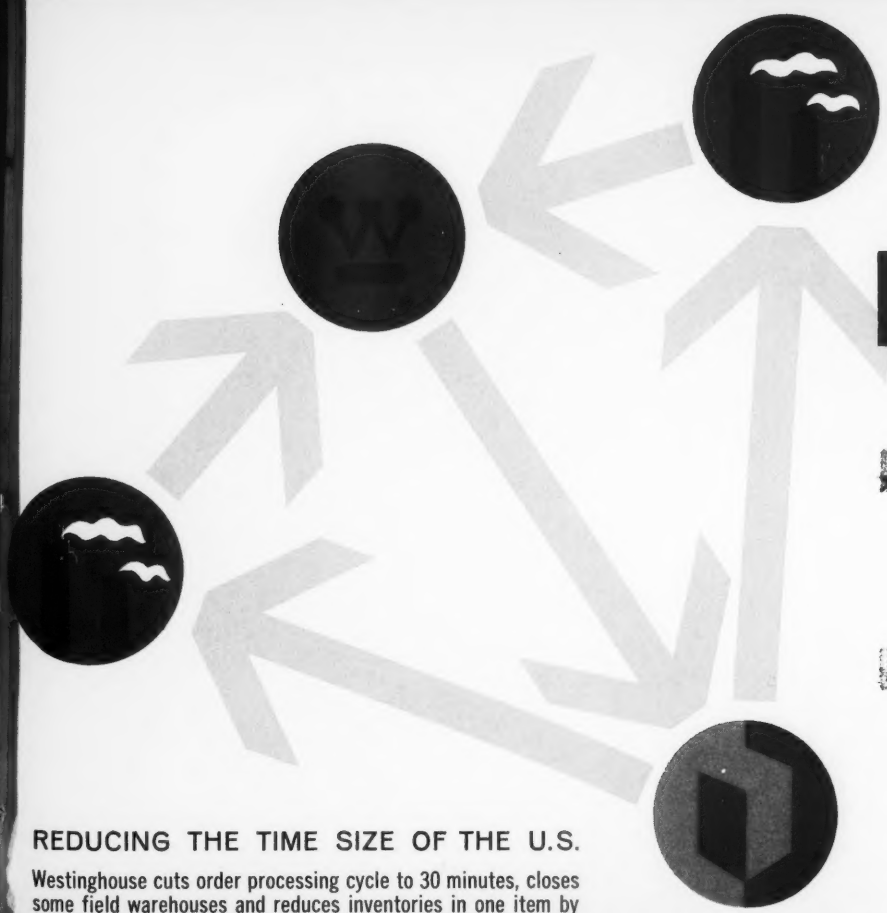
TDM

INVENTORY CONTROL • PRODUCTION PLANNING • MATERIAL HANDLING • TRANSPORTATION • WAREHOUSING • PACKAGING



Traffic & Transportation p. 19

THE LIBRARY OF THE
JUN 19 1963
UNIVERSITY OF ILLINOIS

REDUCING THE TIME SIZE OF THE U.S.

Westinghouse cuts order processing cycle to 30 minutes, closes some field warehouses and reduces inventories in one item by $3 million — while improving cash flow by 5 days. **Pg. 8.**

A Message From the Editor . . .

T & D M TRANSPORTATION & DISTRIBUTION MANAGEMENT
815 WASHINGTON BUILDING WASHINGTON 5, D.C.

Dear Reader : -

One remark kept recurring in the letters we received when T & D M made its first appearance last month: "These are ideas we can use!"

It is particularly pleasing to read such letters and learn that we are on the right track, for in a great deal of what has been said and written about physical distribution heretofore we have felt the lack of practical, down-to-earth information that can be put to use immediately.

T & D M is intended to remedy that lack, to bring together in one place as many of the workable ideas and new developments in all areas of physical distribution as we feel will contribute to the tremendous economies and marketing gains that can result from understanding and application of the physical distribution concept.

We know that not all of our articles will appeal to all of our readers, by any means. But if, each month, we can give you one or two useful ideas in this increasingly important field, we will feel that we are well on the way to accomplishing our purpose. I hope that you will continue to write us to let us know if we are serving you in this way.

Sincerely,
Warren Blanding
Editor

contents VOL. 1 NO. 2

EDITORIAL 2
Notes on the Materials-Distribution-Traffic controversy

WASHINGTON WIRE 3
Executive Dept., Congress, courts and regulatory agencies

INDUSTRIAL BRIEFS 6
Trade Association news, production data and 3 contests

DISTRIBUTION MANAGEMENT TIPS 7
The important role of communications systems in distribution

ORDER-HANDLING AT WESTINGHOUSE 8
Teletype, data processing reduce inventories, speed cash flow

FORK LIFT ATTACHMENTS 14
5 pages of photographs show some of the many "standard" types

GLOOMY ALTERNATIVES TO RAIL-MOTOR COORDINATION, by C. Ray Bryant .. 19
A seasoned transportation man calls a spade a spade

SECRETS OF TARIFF PUBLISHING, by M. R. Denney 24
An "inside view" of a fictitious tariff publishing agency

LOADING SYSTEM FOR PALLETIZED SHIPMENTS 26
"Di Giorgio Method" is tested on transcontinental shipments

OWNING vs. LEASING OF HANDLING EQUIPMENT 30
Clark Rental Corp. head suggests a cost-finding procedure

CONTAINERIZATION MAY COST MORE, BUT— 32
Volkswagen found out that circumstances have to be just right

MATERIAL HANDLING IDEAS 35

MULTI-PURPOSE CORRUGATED CONTAINERS 36
Containers serve for shipment, storage and in-plant handling

PACKAGING/PACKING & SHIPPING ROOM IDEAS 41

Transportation & Distribution Management is published monthly by The Traffic Service Corporation, 815 Washington Bldg., Washington 5, D. C. Tel.: STerling 3-7325. Application to mail at controlled circulation rates is pending at Washington, D. C. President and Publisher: E. F. Hamm, Jr. Editor and Associate Publisher: Warren Blanding. Vice President and Director of Sales: Charles B. Clark (at 500 Summer St., Stamford, Conn.). Art Director: Jack B. Willis. Production: Eustace Durrett. Circulation Director: Richard P. Coleman.

1961, by the Traffic Service Corporation. No part may be reproduced without written permission. Controlled (free) circulation to qualified persons in industry engaged in, or responsible for, one or more functions of physical distribution. Subscription price to all others: $3.00 per annum.

Regional Offices: STAMFORD, CONN. (Advertising Headquarters) 500 Summer St., DAvis 4-4116 (N. Y. City phone CYpress 2-8276). CHICAGO, ILL. (Editorial and Advertising) 22 W. Madison St., FInancial 6-8922. ATLANTA, GA. (Advertising) 1430 W. Peachtree St., N.W., TRinity 6-5658. PALO ALTO, CALIF. (Advertising) 261 Hamilton Ave., DAvenport 6-2700. SAN MARINO, CALIF., (Editorial) Boothe Bldg., 475 Huntington Dr., SYcamore 9-4638. Address all editorial and subscription mail to 815 Washington Building, Washington 5, D. C.

Traffic & Transportation p. 19

Purchasing p. 30

Material Handling p. 14

Packaging & Shipping Rm. p. 32

Warehouse Management p. 14

Sales-Distribution p. 8

Materials Management vs. Distribution Management vs. Traffic Management: Where We Stand

The trade press, of which we are a small and recently-arrived part, has been giving a lot of attention to the "new concepts" in industry which serve in one way or another to help companies operate more profitably. Unfortunately, enthusiasm for what application of the new concepts can do for industry has become wrapped up with a form of what we choose to call "empire building" – deciding, or arguing, that such-and-such a manager is the logical person to take charge of the new function.

As we pointed out in our first issue, last month, new and useful managerial concepts are often rejected by top management because top management feels, with some justification, that the most ardent promoter of the new concept is the individual who stands to gain the most from its acceptance.

We have in our short existence run into a number of cases where acceptance of the physical distribution concept which we advocate has become entangled with a series of what are, after all, nothing more nor less than personality problems.

So, the time has come for us to state exactly where we stand.

We believe, first of all, that physical distribution management is a valid and useful managerial concept.

We have no axe to grind, whatsoever, on behalf of any class of industrial specialists or professionals whether they be traffic managers, marketing managers, sales managers, material handling or packaging managers, or whether they be responsible for purchasing, production or plant management functions.

In fact, we don't care whether *any* company, anywhere, ever "organized" for physical distribution.

As we see it, the importance of the physical distribution function lies in coordination of a series of individual service functions which implement both manufacturing and sales.

Whether these functions are coordinated by a single manager with a distribution title or by the president of the company (who has, after all, this responsibility) is not and will not be a concern of ours.

Our experience has been that men with limited experience are not bound or limited by their specialization if they seek out new ideas and skills. The rags-to-riches story is not so much a fanciful tale as it is a realistic reflection of what can happen to the individual who doesn't stop learning – who doesn't decide, after he has made his mark, that he can best protect himself and his position by surrounding himself with layers of "experience," specialization," and, as a last gasp, "seniority."

So, we can say, in complete sincerity, that materials management, for instance, is a completely valid industrial concept. In fact, from our point of view, the only essential difference between the materials management and distribution management "schools" is in the selection of an individual to head up the function. Since we don't believe that the function – whatever you may call it – has to depend on a single manager, other than the company president himself – after all, doesn't he have the responsibility for Sales and Manufacturing? – we are happy to say that we feel that a material handling manager is quite as qualified to assume direction of the function as a traffic manager or a purchasing manager, a sales manager, a production manager, or even, for that matter, the boss' son.

By the same token, if the function must be headed up, there is some justification for feeling, as many traffic managers do, that since transportation represents the major physical distribution expense traffic managers ought to be in charge of the function.

With this thesis we can also agree, provided the individual traffic manager is willing to learn the new skills needed in physical distribution management.

Similarly with the sales manager, the purchasing manager, the packaging engineer, or anybody else whose job brings him into the broad arena of physical distribution. Whatever the basic job may be, fundamental is an understanding that it is – and *must be* – a service function, and that coordination with other service functions is the very foundation of physical distribution.

In an article in last month's issue of T & D M we compared management's attitude toward the physical distribution – or service – executive with its attitude toward the cab driver who miraculously gets to the airport in time. Whether or not management is justified in this attitude is not in point, but service-orientation on the part of physical distribution men will achieve far more recognition than empire-building and intramural bickering.

Washington Wire

Revelle

Monroney

Executive: Errors and Omissions

With Pres. Kennedy due to get Secy. of Commerce Hodges' short range remedial-action transportation program on November 1, a routine check of White House sources by a newsman uncovered the fact that transportation had been completely sidetracked by the newly-established OEP (Office of Emergency Planning) in its program for defense/survival planning. Not a few transportation men, many of whom had submitted detailed and thoughtful "suggestions" to Secy. Hodges at his request, were shocked to learn that the OEP's organization table showed telecommunications as a major activity but mentioned transportation not at all. Somewhat belatedly, and not until after some strong representations had been made, the White House let it be known that there was in existence a "paper organization" which would "spring into action" in the event of national emergency, and in fact Paul Revelle (who held a similar position with the Office of Civil and Defense Mobilization, OEP's predecessor) had been appointed to head up the transportation facility, but with a limited staff and no emergency control organization at all. Meanwhile, transportation men are biding their time, somewhat impatiently, to see if further progress can be expected, and the powerful National Defense Transportation Association (13,500 members, including most top civilian and military transport men) appears ready to do battle.

The Congress: All quiet . . . almost

With most members of Congress already at home busily mending fences during the current recess, Senator Mike Monroney of Oklahoma lingered in Washington long enough to deliver an acrimonious blast at the railroads (for their selective rate cutting practices) and at the Interstate Commerce Commission for its policy of "approving sharply reduced rail rates between major industrial centers and at the same time approving general rate increases for the same goods for the rest of the counttry." As might be expected, members of the American Trucking Associations, who had invited Sen. Monroney to address them during their 28th annual convention in Washington, applauded heartily. A proponent of S. 1197, the controversial bill aimed at the selective rate cutting procedure, Sen. Monroney's ire may have been aroused by an earlier mention of the bill by Pres. Daniel P. Loomis of the Association of American Railroads, in which he referred to it as "the infamous S. 1197, which is strongly supported by Teamster President Hoffa." What had appeared to be a last-minute drive to get the bill heard this year failed when the Senate commerce committee voted 9-8 not to reconsider its earlier decision to postpone further action until 1962.

The Courts: The Central appeals an 'uncertain and confused' order

What has been an important and controversial topic for some time — railroad contract rates — may be settled by the Supreme Court as the result of an appeal filed by the New York Central Railroad. At issue is the question of whether a railroad may offer shippers special reduced rates in return for guarantees of fixed percentages of their freight business. The ICC, earlier this year, said an emphatic "No!" and ordered cancelled a Central tariff providing such reductions for

The ICC: Merger hearings, and a question: Who controls the N & W?

As the wordage and documentation piled up (see photo), ICC examiners wound up one hearing (C&O-

Weighty evidence: John L. Bradford, veteran ICC examiner, is caught in a hallway of the Commission carrying an armload (only a fraction of the total) of exhibits and printed remarks of some of the hundreds of witnesses appearing in the control proceedings of the Baltimore & Ohio-Chesapeake & Ohio-New York Central railroads. Examiner Bradford presided over all the control hearings, both in Washington and the regional sessions.

shippers agreeing to move at least 80 per cent of the traffic involved – in this case, rugs and carpeting – over Central lines for one year. A federal district court sustained the ICC, and the Central assailed the ICC report as "uncertain and confused" and the lower court's opinion as "unsupportable," asking the Supreme Court to reverse the lower court's opinion, an action which might herald a significant breakthrough by the railroads in their fight to regain lost traffic. Some experts point out, however, that the ICC decided the case on the basis of the unlawfulness of the specific rates, not on the principle of rail contract carriage involved, and that the Supreme Court may see things the same way. **How late is late?** A shipper who did not comply with the interstate commerce act and the bill of lading by filing a claim for shipment damage within the statutory 9 months after delivery was nevertheless permitted to recover when he brought action some 4 years later. The award was based on conversations with an agent of the carrier and the agent's handwritten notation on the carrier's copy of the bill of lading, "Damage on this shipment." By denying the carrier's petition for a writ of certiorari in the case, the Supreme Court in effect disregarded the carrier's contention that to allow payment of claims "not seasonably filed" increased opportunities for collusion and preferential treatment of certain shippers.

Hoffa

B&O control), recessed another (GN-NP-CBQ) and continued receiving testimony in a third (N&W-NCP-Wabash), and heard an announcement in the course of the N&W hearing that the New York Central would shortly ask the ICC to determine whether the Pennsylvania Railroad (which owns 34.06 per cent of N&W stock) does in fact control the N&W, and, if so, if such control is legal. While ownership of such a sizeable block of stock would ordinarily be considered prima facie evidence of control, ICC sources say that determination of control would probably be based on an actual examination of how the stock had been voted, what representation the Pennsy had on the N&W board of directors and similar points. Meanwhile, a newsman covering the "Northern Roads" merger hearing in St. Paul started unravelling the corporate complexities of the 3 railroads involved (GN-NP-CBQ), but wearied when he had listed only those corporations in which the principal railroads owned 50 per cent or more stock (see box). If the Northern Roads merger goes through – and rail officials on both sides privately express the opinion that it will – the result would be the largest privately-owned railroad system in the world: 24,728 miles of track in 17 states and 2 Canadian provinces, 64,000 employees and annual revenues in excess of $700 million. Still to be hurdled, however: Possible strong opposition from rail labor and state governments, as well as a possible fight from a group of recalcitrant Northern Pacific stockholders who feel that in agreeing to the merger the railroad would be "giving away" vast holdings in oil, timber and land.

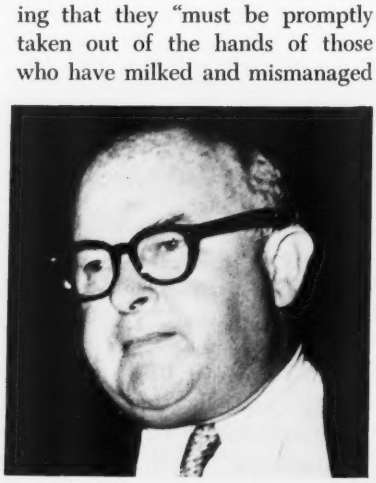
(NOTE: Although the AFL-CIO executive council said in New York that completion of mergers now contemplated would "throw another 200,000 workers on the unemployment rolls," a check of the ICC reveals that the 14 railroads concerned had among them a total of 239,687 employes.)

Bennett

In Washington, the ICC was criticized harshly by the ranking Republican member of the House interstate and foreign commerce committee, Rep. Bennett of Michigan, who said that, despite ICC Chairman Hutchinson's earlier statement that action probably would not be taken on major merger applications until late 1962 or 1963, "the Commission has proceeded at what I can only describe as an almost frantic pace."

Labor: Quill talks roughly, Bridges softly; where's Jimmy?

Transport Workers Union President Mike Quill made no bones about his stand that all transportation and all utilities should be owned and operated by the Federal government to avoid "a complete breakdown of our mass transportation system. Speaking at his union's convention in New York City, Mr. Quill reserved his choice invective for the railroads, declaring that they "must be promptly taken out of the hands of those who have milked and mismanaged



Quill

Bridges

them so brazenly." Out on the West Coast, however, ILWU President Harry Bridges, whose views are not entirely dissimilar from Mr. Quill's, addressed a port management group with more restraint. Discussing his union's new mechanization agreement, he said: "I don't want any of you to draw the conclusion that we are among the great cheer leaders for the free enterprise, profit system. I for one am not. But facts are facts. We try to operate for them. We think the other side does also. The solutions embodied in the new agreement are based on the facts of life of the profit system without any comments or endorsements on our part." Teamsters Union President James R. Hoffa had little to say during the month; under Federal indictment in Florida for what appeared to be strong personal support of the profit system, Mr. Hoffa could reflect on the fact that at the recent meeting of the American Trucking Associations in Washington his name was hardly mentioned at all. Senator McClellan of Arkansas, no friend of Mr. Hoffa's, has bluntly stated his concern about a Hoffa-Bridges alliance and has introduced a bill (S. 2573) directly aimed at restraining "the use of excessive power under certain circumstances in an indispensable industry."

McClellan

Transportation business: Rail, truck, overseas air traffic up; water down

Slow but steady improvement in business registered in most quarters, with both rail carloadings and motor carrier truckloadings inching up week by week. Piggyback loadings continue to show sharp increases, up 10 per cent from last year to 13,088 cars per week loaded with one or more revenue trailers. North Atlantic air carriers showed a 2.2 per cent increase in passenger traffic over last year, a 55.2 per cent increase in cargo. Principal dark spot: domestic water carriers, with a 19.5 per cent drop in freight revenues.

Corporate Complexities in 'Northern Roads Merger'

The names of six railroad corporations appear as applicants in Finance Nos. 21478, 21479 and 21480, the Interstate Commerce Commission dockets comprising what has come to be called the "Northern Roads Merger Case." They are:

The Great Northern Pacific & Burlington Lines, Inc.; the Chicago, Burlington & Quincy Railroad Co.; the Great Northern Railway Co.; the Northern Pacific Railway Co.; the Pacific Coast Railroad Co., and the Spokane, Portland & Seattle Railway Co.

The Great Northern Pacific & Burlington Lines is an existing corporation into which all the applicant railroads would be consolidated, either by merger or lease. The Great Northern and the Northern Pacific are independently owned railroads. About 98 per cent of the Burlington stock is owned equally by the Great Northern and the Northern Pacific. The Great Northern owns 100 per cent of the Pacific Coast. The Great Northern and the Northern Pacific each own 50 per cent of the S P & S.

Numerous other corporations, however, are directly involved in the merger proceeding as corporations owned or controlled by applicant carriers. Those of which more than 50 per cent of the outstanding capital stock is owned by an applicant and the percentage of applicant stock ownership are:

Owned or controlled by the Burlington: The Burlington Truck Lines, Inc. (100 per cent); the Colorado & Southern Railway Co. (74.72 per cent); the Davenport, Rock Island & North Western Railway Co. (50 per cent); the Missouri & Illinois Bridge & Belt Railroad Co. (81.82 per cent), and the Winona Bridge Railway Co. (66.66 per cent). The Colorado & Southern owns 100 per cent of the outstanding capital stock of the Fort Worth & Denver Railway Co.

Owned or controlled by the Great Northern: The Great Northern Pipe Line Co. (100 per cent); the Oregon, California & Eastern Railway Co. (50 per cent); the Spokane, Portland & Seattle Railway Co. (50 per cent), and the Superior & Duluth Transfer Co. (100 per cent).

Owned or controlled by the Northern Pacific: The Camas Prairie Railway Co (50 per cent); the Duluth Union Depot and Transfer Co. (100 per cent); the Northern Pacific Transport Co. (100 per cent); the Spokane, Portland & Seattle Railway Co. (50 per cent), and the Walla Walla Valley Railway Co. (100 per cent).

Owned or controlled by the Spokane, Portland & Seattle: The Oregon Trunk Railway (100 per cent) and the Oregon Electric Railway Co. (100 per cent).

INDUSTRY BRIEFS

MATERIAL HANDLING INDUSTRY: Despite a drop of nearly 45 points in dollar volume of incoming business as reported in its monthly bookings index, The Material Handling Institute states that heavy orders for highly engineered handling systems in May and June swelled the index out of proportion to the general upward trend, feels that the trend for the industry will continue a gradual upward climb, with overall books picture at year-end higher than in 1960.

C.I.T. ENTERS LEASING: Expansion of operations into material handling field has been announced by C.I.T. Leasing Corp., machinery and equipment leasing affiliate of C.I.T. Corp., industrial and consumer finance organization. Parent corporation already offers traditional installment buying programs, has national organization with 22 division offices throughout U.S.

PALLET BOXES VS. BURLAP BAGS: Report from U.S. Dept. of Agriculture on "Handling and Shipping Potatoes to Processing Plants in Pallet Boxes and Burlap Bags" discusses and illustrates operating procedures, material handling and plant layout, contains extensive analyses of direct and indirect costs. Conclusion is that costs of labor, equipment, materials, space, transportation of containers (700 miles), losses from injury, and truck tie-up time are less for the bag method than the pallet box method, but use of sacks increases overhead costs for indirect loading, losses during transit due to adverse temperatures, and quality losses in storage. Report states that if bags are used for one trip only and have salvage value of $0.05 each, pallet box method is cheaper than bag method. 34-pg. booklet is priced at 25¢, can be obtained from Superintendent of Documents, Government Printing Office, Washington 25, D. C., by ordering U.S.D.A. Marketing Research Report No. 495.

FIBRE BOX ASSOCIATION: Fibre box production is presently breaking all records, and forecasts indicate that the demand for fibre boxes will advance "a strong 8 per cent" in 1962, Association reports. Lloyd Merwin, vice president of Crown Zellerbach Corp. and general manager of its Gaylord Container division, was elected president of the association at its annual meeting; Edwin D. Dodd, vice president of Owens-Illinois Glass Co. and general manager of its Forest Products division, was elected vice president. For news of 1962 competition, see below.

CONTESTS & COMPETITIONS: Clark Equipment Co.'s 1961-62 contest awards $2000 first prize, nine other prizes for original papers written on theme "Cost Reduction through Materials Handling," has April 1, 1962 deadline. For details, write the company's Industrial Truck Division at Battle Creek, Mich. Fibre Box Association competition for members will be held in May, 1962, to select best new developments in past 3 years. Three awards will be in each of four categories: new uses, printing design and quality, construction, and point of purchase material. Society of Packaging & Handling Engineers announces its National Professional Papers contest, open both to members and non-members, with two $250 first prizes and eight other prizes. Contest closes March 15, 1962, but entrants must file notice of intention to compete before January 31, 1962, with the contest chairman, Fletcher Day, Cannon Electric Co., P. O. Box 2316 – Terminal Annex, Los Angeles 54.

AMERICAN MANAGEMENT ASSOCIATION: Seminars in various areas of physical distribution management have been announced for 1961-62, as follows: *Organizing for Effective Warehouse Management*, Nov. 27-29, 1961, Hotel Astor, New York City; *Product Distribution Management*, Feb. 5-9, 1962, AMA Academy, Saranac Lake, N. Y.; *Organization & Management of the Company's Traffic Function*, Feb. 7-9, 1962, Hotel Astor, New York City; *Management of the Company's Private Truck Fleet Operation*, Feb. 12-14, 1962, Statler-Hilton, Dallas; *Order Picking, Packing & Warehousing*, Feb. 26-28, 1962, Hotel Astor, New York City. Write to Amos R. L. Deacon, Jr., Program Director, manufacturing division, American Management Association, Saranac Lake, N. Y., for full information.

PACKAGING INSTITUTE: L. H. Zahn, director of purchasing and package development at Ciba Pharmaceuticals, Inc., has been re-elected president of the Institute for 1961-62. W. B. Tibbets, project manager of the Container Development division of Union Carbide Plastics Co., was elected vice president in charge of the Institute's technical committee activities. The organization's 1961 Professional Award for contributions to packaging technology was made to E. H. Balkema, director of purchasing, Household Products division, Colgate-Palmolive Co.

DISTRIBUTION MANAGEMENT TIPS

Communications techniques tie in closely to physical distribution management, are worth reviewing frequently. Although emphasis is usually given to electronic systems capable of rapid and accurate transmission of programmed order and production data, a lot can be done to improve communications techniques at such elementary levels as voice communication via intercom and visual communication via charts and graphs. The company that has no need for elaborate and extensive field communications may still find substantial savings possible on its shipping platforms or open storage areas. Then, too, the physical distribution applications of a communications system may not be enough in themselves to justify investing in it, unless some good, strong applications can be shown for other company operations. As a practical matter, managers involved in physical distribution will do well to take the lead in recommending improvements in communications techniques, if only to avoid the eventuality that any new installation will have physical distribution applications as a by-product and will be poorly fitted to do the job at hand. Herewith are some recent developments with physical distribution applications:

Multiplant manufacturers with problems arising from traffic jams on private wire systems are already facing what could be potentially expensive delays in order processing. One new development worth watching is the Bell Telephone System's "Line Switched Teletypewriter Service," put into operation for Delta Air Lines in late September. Basically, what the system does is provide direct distance dialing for the airline's 80-station teletype network in 25 states and to automatically provide alternative routing where lines are tied up. One significant feature is that switching equipment is now located at telephone company offices. At Delta, the sending station consists of a teletypewriter containing a "Codomat," a wheel-type rotary file containing a plastic card perforated with a station number and an individual station address for each receiving station on the network. By moving the wheel to allow a specific card to be pulled into a slot on the Codomat machine, the number and address of the called station is perforated into the outgoing message tape. Prepared tapes can be transmitted immediately, without the delays of message storage and relaying encountered in conventional systems. (No. 164, Distribution Data Card)

Where actual words-per-minute rate is a factor, the Digitronics Corp.'s "Dial-O-Verter" System installed at Mohasco Industries' central production control and order department headquarters is enabling the carpet manufacturer to transmit data to its 1,200-mile distant major manufacturing division at the rate of 1,000 words per minute. The paper tape terminals of the Digitronics system at Mohasco have enabled transmission of some million words without error. A further refinement in the Digitronics system will be the introduction of magnetic tape terminals, which will increase speed of transmission to 1,500 words per minute. (No. 165, Distribution Data Card.)

A closed-current television system with greater flexibility for warehouse and terminal area surveillance is announced by Diamond Electronics, with introduction of its all-weather "Hawk 401" system. "An exposed rooftop camera installation clearly shows activity inside a plant truck loading area across more than 500 feet of brilliantly sunlit plant yard," says the company. "At night, the same camera takes up guard duties over a plant exit door illuminated by a single shade 100 watt light bulb, without mechanical compensating devices and without readjustment of camera controls." (No. 166, Distribution Data Card.)

(Continued on page 42)

AT WESTINGHOUSE:

order-processing system improves cash flow by 5 days, cuts inventory in one product from $5 to $2 million and permits direct shipping from plants to customers

The automatic order-processing system used by Westinghouse Electric Corporation's apparatus products group has a 30-minute cycle from filing of an order by any one of 90 sales offices to receipt of shipping instructions at the plant or field warehouse which can offer optimum delivery. While such a system has obvious benefits from the standpoint of customer service, it also permits important fundamental changes in the company's physical distribution system.

Here are the principal benefits of the system, as described by Westinghouse:

1. Faster delivery to 15,000 customers;
2. Closing of some field warehouses, drastic stock reductions in others;
3. Reduced inventory costs — a cut from $5 million to $2 million in inventory level of one product alone;
4. Improvement of cash flow of at least 5 days;
5. Immediate inventory record updating;
6. Increasing number of shipments directly from plants;
7. "Automated" reordering of low-stock items;
8. Production of sales and tax statistics and complete financial accounting.

Nerve center of the Westinghouse system is a dual IBM RAMAC 305 in the company's Pittsburgh headquarters. The RAMAC (short for Random Access Method of Accounting and Control) has a storage capacity for 20 million digits of information, and is tied in to the company's private teletypewriter network connecting sales offices, field warehouses and plants.

The computer's memory unit stores complete customer information, inventory and cost data on some 42,000 stock items which represent about 55 per cent of the orders received and are manufactured at 19 different plants. Into the computer are fed punched cards representing some 1500 to 1600 orders daily, received from more than 90 of the company's sales offices via teletype.

The computer locates the stock at the warehouse or plant nearest to the customer, updates inventory records, and punches out sta-

tistical and invoice cards. The invoice cards are first used in an accounting machine to print invoices and then, after their data has been converted to tape, to transmit to warehouses and plants information that comes out of their teletypewriters in the form of complete shipping orders, packing lists, labels and the required number of bill-of-lading copies.

One immediate benefit of the system is that the company can expedite its cash flow by billing before an order is actually shipped, knowing that a chosen warehouse can ship if the computer says the item is in stock there. It is standard procedure that no confirmation of shipment is made from the warehouse to the order-processing center.

Because the system maintains up-to-the-minute information on inventory balances and locations it has been possible to both reduce and balance total inventories while also achieving warehouse cutbacks. The same inventory data goes to each of the manufacturing plants to be used in production planning. Punched cards are automatically produced for items whose inventory drops below a predetermined order review point, which virtually automates reordering.

For an evaluation of the system, here are the views of D. C. McAlister, manager, distribution accounting and procedures, the man who put it into operation:

"Our entire warehousing pattern is changing under the impact of this new speed of getting an order from a sales office to a shipping point, no matter where either might be . . . we have eliminated the 2 to 4 days an order previously spent in the mail and the 2 additional days required for its handling at the shipping point.

"We have replaced this 6-day cycle with a 30-minute cycle.

"Even in cases where our sales office and warehouse are in the same city, we find this 30-minute cycle cuts a full half-day off the former order-processing time."

Mr. McAlister points out that at one time each sales office would choose its own warehouse and would handle all stock records locally. Using hand posting, it was possible to take off inventory totals for Pittsburgh headquarters only about once a month, with the result that maintenance of stocks and synchronization of production became virtually impossible. The only answer was to carry high inventories in almost every location, at a cost approaching 20 cents on the dollar.

Another factor was transportation; a continuing improvement in common carrier service meant that in some cases it was taking longer to process orders than it was to deliver them, even from relatively distant points. On the average, half of the time from receipt of order to delivery to customer was taken up with order handling. Thus, if order time could be reduced by 24 hours, for example, customers could be served from warehouses 24 hours more distant than before, without any detriment to the service they were accustomed to getting. The fact that order handling has actually been reduced to 30 minutes, Mr. McAlister feels, means that certain stocks such as integral electric motors can be supplied from as few as 5 points, instead of the 26 warehouses now used. "Five good inventories are better than 26 with the same total amount of stock," he says.

The RAMAC installation has practically eliminated guesswork from such major steps as warehouse closings and stock reductions, he points out, because it is possible to test the alternatives in actual day-to-day operations, simply by routing shipping orders to the alternate locations.

"Every logic," Mr. McAlister says, "would seem to point to fewer warehouses, and these with the better all-around serviceability that fewer, more comprehensive stocks permit doing a perfectly satisfactory job of servicing our customers. Suppose we do occasionally have to resort to shipping from these fewer locations by either air express or air freight? This would seem to be a small premium to pay for the elimination of as many field warehouses as seems logical."

Although Westinghouse officials are quick

to say that the order-processing system works for Westinghouse where it might not work for another firm – a highly complex organization, and one of the largest U. S. shippers of small shipments, when it undertook the new order processing system, Westinghouse had already in existence the largest industrial teletype system of its kind – these same officials will point with some pride to the ranging, 5-story building on Pittsburgh's Susquehanna St. which houses the RAMAC installation and some of the company's atomic energy projects.

"This used to be our Pittsburgh warehouse," they will say, "but we don't need it any more."

HOW THE SYSTEM WORKS:

Shipping orders, inventory records, invoices and reorder cards are prepared automatically

Key elements of the Westinghouse order processing system are: teletypewriter stations at all sales offices, warehouses and plants; a network of teletype lines; and in the order processing center in Pittsburgh are teletypewriter stations, tape-to-punched card converters, two control consoles served by two random-access memory units connected in series, accounting machines and a remote inquiry station.

Customers mail or telephone their orders to the nearest of more than 90 Westinghouse sales offices. There the order is coded with a six-digit, self-checking address number from which the computer can locate all customer information (such as name, shipping and billing addresses), and a five-digit self-checking product number.

The order then goes to a typist who cuts a five-channel paper teletypewriter tape, including a two-letter station code, the customer number, product number, quantity ordered, and customer's purchase order number. The typical order includes 55 characters plus any special instructions when necessary.

The tape-coded sales order is automatically

Chicago

Dallas

System in action: 1. Customer mails or phones order to local sales office, in this case Dallas. Order is encoded with customer number, product style number and other data and teletyped to order processing center in Pittsburgh. 2. Order is received in Pittsburgh on tape, and information is transferred automatically to punched cards to be fed into computer system. 3. Computer determines that order can be filled from company warehouse in Houston, turns on teletype in Houston warehouse

Pittsburgh

Houston

which automatically prepares all shipping documents. At the same time an invoice is automatically prepared and mailed from Pittsburgh to the customer in Dallas. **4.** At Houston warehouse, teletyped forms are matched to proper equipment in stock and it is prepared for shipment to Dallas. By this time, all paper work has been done, all inventory records updated, more of the item ordered for the warehouse if the stocks had become low, and an invoice has already been mailed to the customer from Pittsburgh. **5.** If the Houston warehouse is out of stock, the order processing center's computer reviews the inventory of other warehouses reasonably adjacent to Dallas and locates the item in Chicago, routing the shipping instructions there instead of to Houston. As in the case of Houston, the item is ready for shipment from Chicago is less than an hour after receipt of the original order in Dallas, and all paperwork has been completed.

routed to the order processing center in Pittsburgh where it comes in over one of seven lines provided for this purpose. It is reproduced in both perforated paper tape and typed copy, the latter simply as a precaution.

The tape is put through a tape-to-card converter which punches the transmitted order information into 80-column sales-order cards. These cards are fed into one of the dual RAMAC 305 computers on the first of two passes. The initial pass edits the orders for errors and for any future deliveries. The computer checks its inventory records and locates the ordered merchandise, searching first at the shipping point nearest the customer. It also offsets cards for merchandise which is temporarily out of stock.

It then updates its inventory files, reducing them by the order quantity, temporarily stores the order on its disk memory, and punches out an interim card for each order.

(While the computer could be adapted to direct input of the five-channel paper tape, this was not deemed desirable because Westinghouse wanted the safety factor of the first pass to prevent errors from getting into the system.)

The interim cards are fed into the other computer's processing unit for the second pass. The computer assigns an invoice number to the order, prices it, discounts it, applies sales and use taxes where applicable, and inserts the shipping warehouse teletype address code. It punches out one card for each line on the invoice, and a series of statistical cards. Reorder cards are also prepared for items that have dropped below the order review point.

The statistical and reorder cards are separated for later processing. The invoice cards are put through an off-line accounting machine to print the invoices.

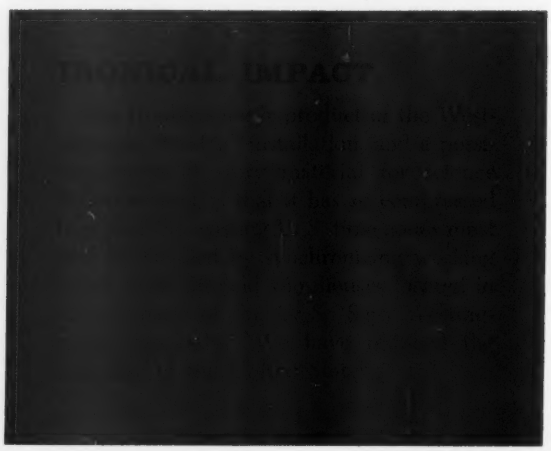
The invoice cards are then sorted geographically into four groups and put through a card-to-tape converter to transfer their information onto five-channel paper teletypewriter tape.

This tape is placed on the proper one of four leased lines used solely for shipping-order traffic. These operate at 100 words a minute. The teletypewriter address code preceding each sales order automatically turns on a receiver in the proper warehouse or plant and the shipping-order set, now increased from 55 inbound words to an average of 101 words by use of the interpreted information stored in the computer, is printed. It includes the shipping order, packing list, label, and the required number of bill-of-lading copies (which varies with the shipping point).

The system provides two paths of inquiry for salesmen who wish information on items in stock. One is via a coded inquiry which comes in over the same machines as the sales orders and which is answered automatically by the computer. The other is via a message inquiry. A salesman teletypes his question to a stock control group adjacent to the order processing center. Beside the teletypewriter receiver is a remote inquiry station connected to the computer. An operator keys in the query and gets a virtually immediate response. She then teletypes the reply to the salesman.

The computer used by Westinghouse for processing orders is a dual IBM RAMAC 305 electronic data processing system which offers electronic access, within less than a second, to any one of up to 20 million digits of information stored on its magnetic memory disks. It has the ability to process information without regard to sequence.

The Westinghouse system consists of two input, memory, processing, and output units, connected in series. Each memory unit is made up of a stack of 50 double-capacity



magnetic disks to provide 10 million digits of storage in one disk file, or a total of 20 million in the system. The disks rotate at 1200 rpm and data is recorded on both sides of each of them.

The computer can accept punched card input at a speed of up to 125 cards per minute. Cards can be read while the computer is handling other information, thus reducing over-all processing time.

The two card-punch units issue output cards at up to 100 a minute. Information flows to them directly from the tracks of the drum memory in the computer's processing unit.

Printed documents, such as the invoices, are prepared on continuous forms from output cards on an off-line accounting machine at up to 150 lines a minute.

The main memory disk units essentially serve as vast "electronic file cabinets," from which information is available almost immediately. In addition, the computer contains memory capacity for processing this information.

The Westinghouse teletypewriter network, the largest industrial network of its type in the world, includes 230 sending stations, 243 receiving stations, 20 interconnecting TWX stations, 26 Westinghouse Canadian stations interconnecting, and 14 independent distributors, linked by 28,700 miles of duplex (simultaneous two-way transmission) lines feeding into two automatic switching units in Pittsburgh. Last March, this network carried a record total of 309,859 messages and orders. Four additional, separate lines that can carry sales orders from the order processing department to the warehouses add another 5,263 miles of wire.

"The total possibilities of expense reductions and inventory efficiencies are tremendously impressive."

The brain behind the "brain" — D. C. McAlister, manager of distribution accounting and procedures at Westinghouse, hardly looks the part of a man who can unleash 20 million digits of information at the drop of a punched card, yet he is responsible for putting into operation an order processing system which has cut the order-filling cycle to 30 minutes and has permitted inventory reductions of almost $3 million in one product line alone as well as closing of some warehouses and an increasing number of direct shipments from plants. "This system is changing drastically our traditional ways of getting our products to market," he says. "I am certain our entire warehouse pattern will change." Noting the increased number of direct shipments from plants, he adds: "This trend will serve Westinghouse to reduce the physical size of its field distribution system."

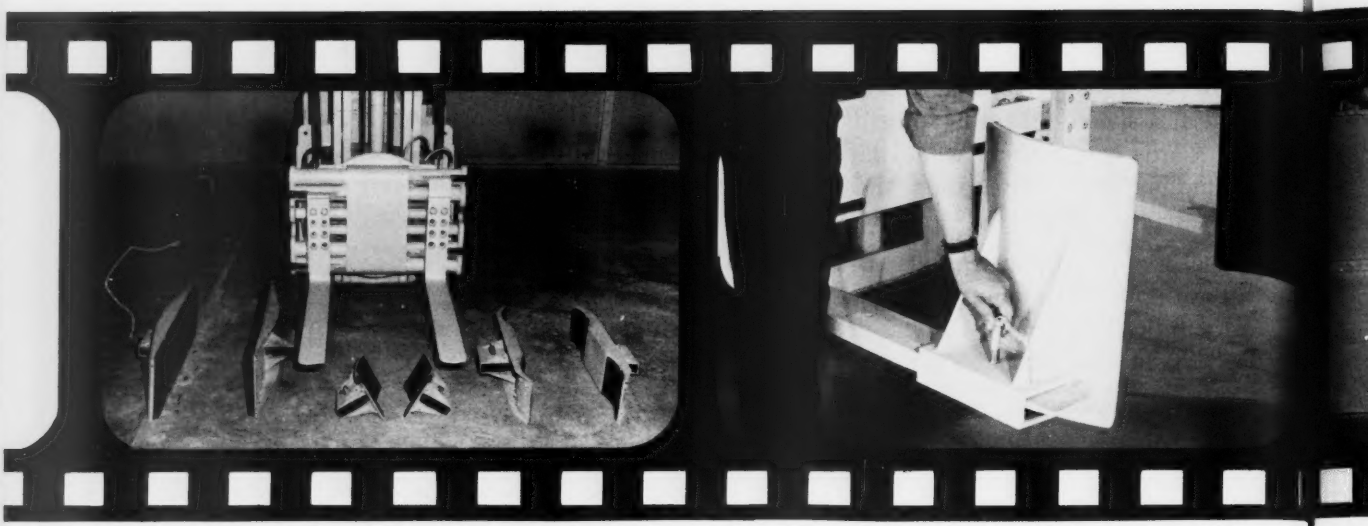
SIGNS OF THE TIMES

C-28-51 (S) PRO. — Amd. SWL 196-B and Indiv. LBR. Tars. by add. new commod., viz.: SECTIONS, FALL-OUT SHELTER, wooden, consist. of studs with plywd. glued or not glued on one side, subj. to Native Lbr. rates.

— *Traffic Bulletin,* October 7, 1961

License plates for oxcarts, 27,600; 40% gel dynamite, 600 boxes; tender No. 59. Proveeduria Especifica De Obras Publicas, Edificio Morazan, 20. Piso, 8a Calle Poniente No. 210, San Salvador, El Salvador.

— *Foreign Commerce,* October 2, 1961



Fork lift attachments

Most fork lift manufacturers will engineer them to your specifications—but there are more than 100 'standard' attachments available, any one of which may do the job

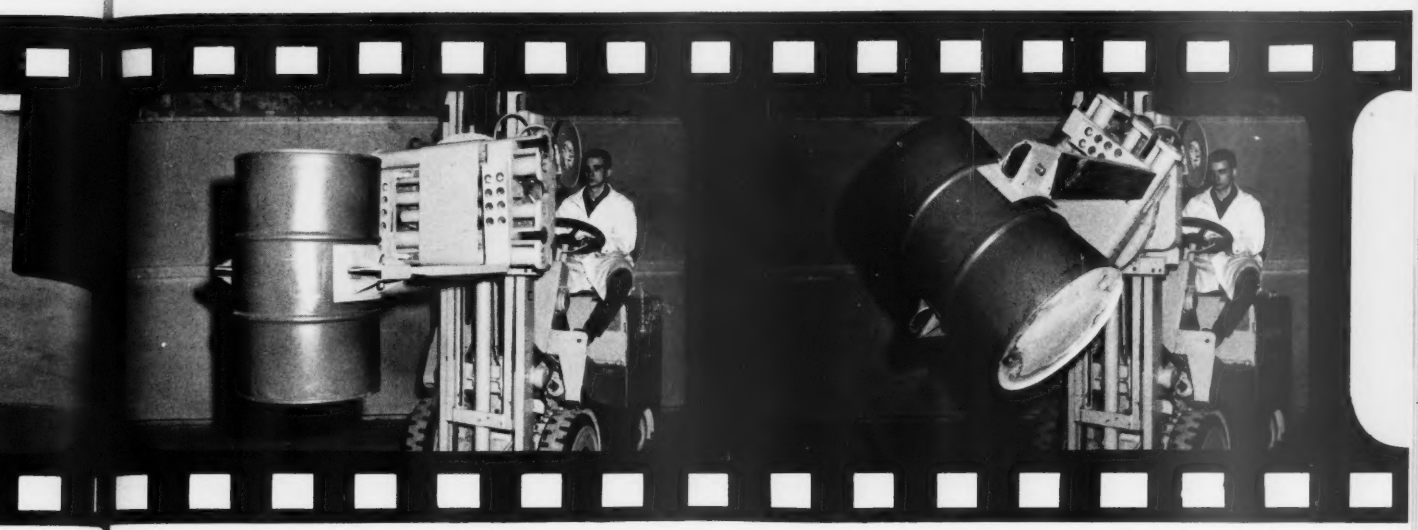
Fork lift truck attachments can be an important factor in: (1) Cutting handling costs, through savings of time and labor; (2) Increasing available storage space; and (3) Reducing product damage.

Many of the commercial attachments now on the market are aimed specifically at palletless handling. Clamps for cartons, barrels and bales, drum and barrel manipulators, and rams for rolled materials, coils and the like fit in this category. Side shifters and load stabilizers have both palletless and palletized applications. Another category of attachments – snowplows, hoppers or scoops, and cranes – have the effect of making the fork lift into a different piece of machinery for a special job.

While most of the attachments on the market are hydraulic or mechanical, there are some special units utilizing magnets or vacuum cups. Some crane attachments operate from an auxiliary winch installed on the lift truck.

The principal limitation of attachments is that they reduce the effective capacity of the fork lift, sometimes by as much as 2,000 lbs. This may involve going to a higher-rated unit in order to achieve the necessary capacity. The time required to attach and detach the units can also be a limiting factor, particularly where uneven material flow requires frequent changeover. Another limitation applies largely to the more complex attachments, or those which "convert" the fork lift

3 sets of attachments for electric fork lift truck equipped with rotating clamp attachment slide on to forks, are held in place by pin. Carton clamps are at left, single drum clamps in center, double drum clamps at right. Rotating device can be tailored for any degree of rotation through 360° continuous, are available for fork lifts with capacities up to 20,000 lbs. **(Automatic Transportation Co. — for more information circle No. 169, Distribution Data Card)**



Action photos show on-the-job applications for standard commercial attachments, plus uses on narrow-aisle equipment in storage, warehousing

into something else: the farther away a fork lift gets from its original function, the more inefficiently it performs.

If there is sufficient handling work of a special nature to warrant it, this is the point at which to consider having a manufacturer custom-engineer an attachment. While this will limit the unit's flexibility it may save

Heavy-duty equipment manufactured by Silent Crane & Hoist Co. has detachable ram (left), which can be used with forks folded back, crane with independent load line and winch. Unit has capacities up to 24,000 lbs. on forks, 12,500 lbs. on hook at 56" boom reach. Conversion from fork truck to crane is accomplished in minutes, says manufacturer, by driving up to boom, attaching apron hooks and raising into position with load line. **(For more information, circle No. 170, Distribution Data Card)**

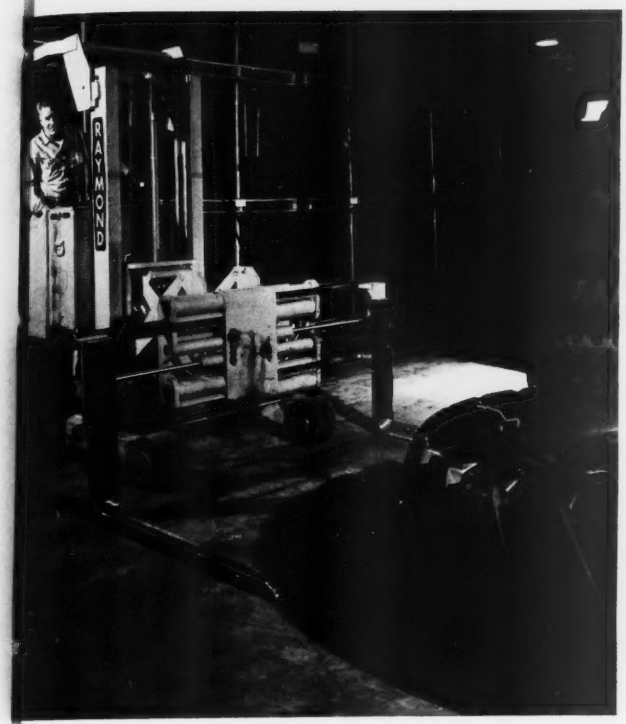
enough time and manpower to warrant investment in a standard unit for all conventional handling jobs.

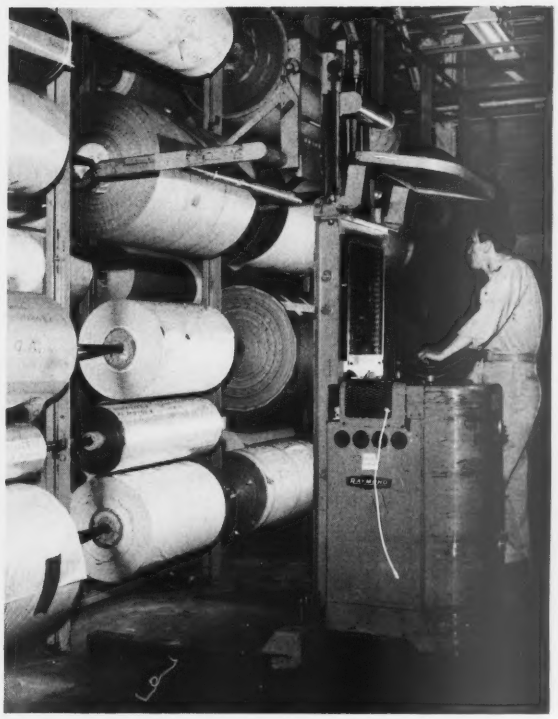
On the other hand, it will very often pay to look into the possibilities of modifying existing handling and storage systems to take advantage of standard attachments and equipment already on the market. The more compatibility between the equipment itself and the system it "serves," the more it will give a better return on investment.

Most of the standard commercial attachments are manufactured by Little Giant Products, Inc., of Peoria, Ill., which manufactures closely with lift truck manufacturers and both hydraulic and mechanical attachments, and Cascade Manufacturing Co., of Portland, Ore., which specializes in the hydraulically actuated attachments. Both companies work their dealers.

Although there is some resistance among buyers to ordering fork lifts with attachments — on the ground that they become tied to a certain manufacturer's equipment — manufacturers generally attempt to steer their customers to the standard commercial attachments and build special attachments to meet individual needs only where there is nothing else available to do the job.

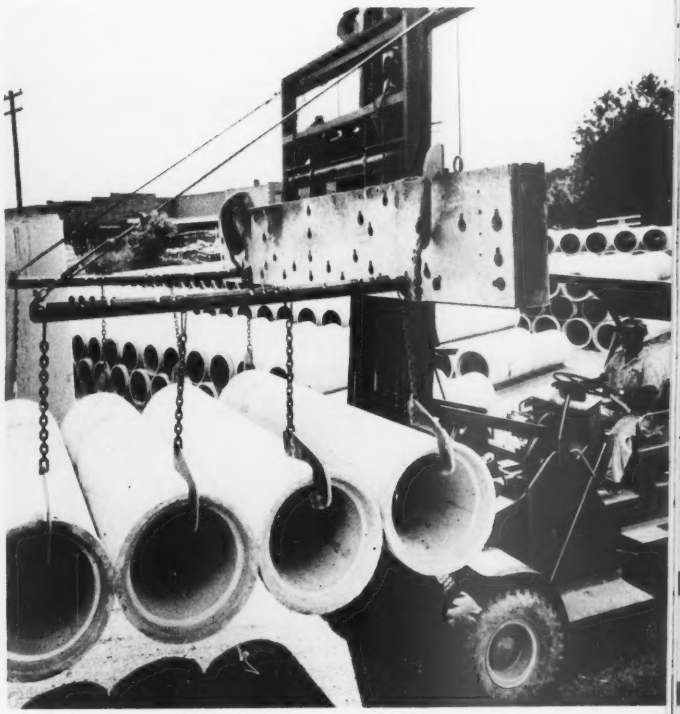
Specially designed boom attachment and remote control unit (left) enable lift truck operator to position delicate nose cone assembly on grinding table within thousandths of an inch. Photo is taken at Brunswick Corp.'s Defense Products Division. "Multi-handler" (right) handles stacks of up to 5 large cartons without forks, using fingers which fit slots in cartons. **(Baker Industrial Trucks Div., Otis Elevator Co. — for more information circle No. 171, Distribution Data Card)**





Large tires of varying sizes can be handled with hydraulically adjustable forks (left), which can be narrowed to conventional width for handling pallets. Photo at right shows special forks which engage shafts on rolls of cellophane which are stored on racks for protection against damage. **(The Raymond Corp. — for more information circle No. 172, Distribution Data Card)**

Hydraulic carton clamp has thin arms to aid in picking up closely stacked unit loads, side-shifting feature to aid in positioning load. Unit is designed for palletless handling of light, bulky materials in cartons. **(Allis-Chalmers Mfg. Co. — for more information, circle No. 173, Distribution Data Card)**

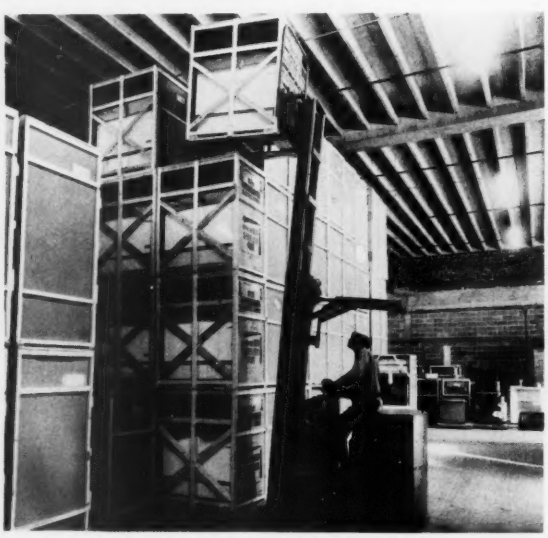


Adaptation of Gerlinger fork lift permits N. C. concrete pipe and beam manufacturer to use 2½ and 3" steel shafts as rams or as supports for special claws or slings to carry pilings or pipe sections in multi-unit loads. **(Towmotor Corporation — for more information, circle No. 174, Distribution Data Card)**

Attachments on high-stacking, narrow aisle equipment are used to increase storage capacity by cutting aisle width

Several case histories on high stacking, narrow-aisle equipment, either with attachments or with special integral features, illustrate how this specialized equipment can add substantially to useable storage space. In a completely palletized operation at Terminal Bonded Warehouse, Charlotte, N. C., a total of 82,500 extra cubic feet of storage space was gained through use of its equipment of this type, according to Lewis-Shepard. The savings was effected through reduction of aisle width and maximum use of air rights, stacking up to 16½ feet high.

Warehouse capacity at the Glidden Company's paint division at Reading, Pa., was increased 36.8%, according to Towmotor Corp., through use of its "Naro-Aisle-Stack" fork lift truck, which has as integral features a tilting mast and pivoting front end which permits 90° right and left stacking in 6′ aisles. Officials at Glidden say that 1,650 pallet loads are stacked up to 14′ high in an area formerly accommodating 1,160 and that the equipment has enabled them to redesign their warehousing system so as to eliminate the necessity of building extra facilities.



Side-shifter mounted on Lewis-Shepard "Spacemaster" electric truck enables operator to move his load 4" to either side of center without moving the truck. Feature permits accurate positioning of crated electric stove at ceiling height, saves "hours" for Terminal Bonded Warehouse, Charlotte, N. C. **(For more information, circle No. 176, Distribution Data Card)**

These two case histories bear out the point made earlier that modification of an entire storage system to make optimum use of existing equipment on the market may be preferable to bearing the cost of having custom-made equipment engineered for a particular use.

Tilting mast feature of Towmotor "Naro-Aisle-Stack" fork lift truck permits high-stacking operation in 6′ aisles, has enabled Glidden Co. to increase storage capacity by 36.8%, according to manufacturer. Unit will stack with forks at 90° angle, right or left, has counterbalancing outrigger. **(For more information, circle No. 175, Distribution Data Card)**

Narrow-aisle fork lift has thin chisel forks which eliminate need for pallets when moving large appliances, like the automatic washers shown, which come packed on thin dunnage strips. Pantograph feature extends reach of forks for loading and unloading operations in cramped quarters. **(For more information, circle No. 177, Distribution Data Card)**

In a remarkably lucid discussion of a complex and controversial problem that affects every manufacturer and shipper of goods, the principal transportation rate expert of the California public utilities commission discusses

THE GLOOMY ALTERNATIVES TO RAIL-MOTOR COORDINATION

by C. RAY BRYANT
Principal Transportation Rate Expert
California Public Utilities Commission

The Public Interest in Coordination

It is axiomatic that coordination between railroads and motor common carriers is in the public interest. Lack of coordination makes for economic waste. Coordination of the two modes has been an objective of public policy as long as there has been a motor carrier industry. Part II of the Interstate Commerce Act, which brought motor carriers under regulation in 1935, was based upon recommendations developed by the Interstate Commerce Commission after a two-year investigation which concluded in 1932. It is significant that the title of that early investigation proceeding was "Coordination of Motor Transportation." It is our present National Transportation Policy as declared by the Congress to provide for regulation of all modes of transportation, all toward the end of developing, *coordinating*, and preserving a national transportation system adequate to meet the needs of the commerce of the United States, of the Postal Service, and the National Defense. I emphasize the word *"coordinating."*

Coordination to Date: Precious Little

Although coordination between railroads and motor carriers clearly is in the public interest, although coordination has been a goal for more than thirty years, although coordination is a basic purpose of our National Transportation Policy, it must be conceded that coordination has not been achieved.

Coordination between railroads and motor carriers requires that the two modes be joined together by through routes and joint rates, just as the railroads have been coordinated for many decades. A carload of freight may move freely from one railroad to another over through routes and on a single bill of lading.

However, if one carrier is a railroad and the other a motor carrier, it is exceptional to find a through route established so that freight may be interchanged freely and move on a single bill of lading. When through routes and joint rates have been widely established so that highway trailers and containers of various kinds can be routed freely between railroads and motor carriers, as freight cars are now routed between railroads, then we will have coordination of the two modes.

The physical interchange between railroads and motor carriers is certainly practicable. It is being done every day. I refer to highway trailers moving on rail flat cars and to containers transferred between motor vehicles and rail cars.

These methods of coordinating rail and truck service physically are not new. Con-

tainer service was first tried out by the New York Central between Chicago and Cleveland in 1921; and highway trailers were being moved on specially constructed flat cars before 1932. With the recent upsurge of interest in the possibilities of container and piggyback service and much improvement in the art, there is no practical barrier to the free interchange of freight between railroads and motor carriers. All that is lacking is the will to coordinate, and the establishment of through routes and joint rates to that end.

We have some coordination, of course; in fact, quite a lot. There have been some through routes and joint rates between railroads and motor carriers as long as motor carriers have had status as common carriers. In May of this year the Missouri Pacific and the Kansas City Southern railroads reported the development of an extensive program of joint rates and through routes with nearly 300 southwestern motor carriers.

There are many other examples of rail-truck rates in various parts of the country. These examples of coordination are most encouraging; but they are still the exception rather than the rule. By and large, after 25 years of motor carrier regulation, there is precious little coordination between railroads and motor carriers today.

The Attitude Toward Coordination: Apathy and Opposition

Why has there been so little coordination between railroads and motor carriers? The underlying reason is that the attitude of the railroads toward joint undertakings with motor carriers has been one of apathy or downright opposition. The railroads had a monopoly on transportation until the motor truck developed into a competitive force. The railroads were the principal advocates of the legislation which brought the motor carriers under regulation in 1935. Highway trucking at that time was made up of generally small-scale operators. It is understandable that the railroads at that time would be reluctant to enter into joint arrangements with these new small-scale competitors.

The railroad point of view was made evident from the start. The first motor carrier tariffs were filed with the Interstate Commerce Commission in 1936. At that time the Chicago Great Western Railroad established through routes and joint rates with 30 motor common carriers for freight in highway vehicles moving on rail flat cars. What happened? Did other railroads join in the through routes? To the contrary, most of the other railroads in the United States joined in protesting to the Interstate Commerce Commission.

Why did they protest? The position of the protestant rail lines was stated in the 1936 decision of the Interstate Commerce Commission as follows:

> *"They are apprehensive of the effect which those rates will have on the all-rail rate structure if they become effective. They fear that when shippers are generally familiar with them and the character of service which they cover they will be called upon to meet the competition by offering similar service at competitive rates or by making reductions in their all-rail rates, or, failing to do so, suffer substantial losses of traffic, either of which would have an adverse effect upon their revenues."*

In 1935 and again in 1937 the railroads, through their Association of American Railroads, adopted resolutions declaring a policy that no new rates should be published on loaded trucks, trailers or truck bodies, nor on containers, and opposing the establishment of joint rates with highway carriers. The Attorney General of the United States filed an anti-trust suit charging the railroads with a combination in conspiracy to restrain interstate commerce. The resolutions were rescinded, but it appears that the railroad policy of oppositing joint rates with highway carriers continued.

Apprenhensions and Fears

The apprehensions and fears in railroad circles on the subject of joint rates with motor carriers, as recorded by the Interstate Commerce Commission in the *Chicago Great*

Western case of 1936, still dominate railroad thinking today. How do we know? Their actions and their words tell us so. For example, I had the pleasure of hearing the President of The Association of Western Railways give an address at San Francisco on November 22, 1960. He said:

> *"Our competitors persist in suggesting that the public benefits which can be expected to flow from common ownership, can be obtained by voluntary coordination of two or more types of transportation through joint rates and through routes.*
>
> *"To claim that there are workable alternatives to intermode ownership is to dwell on theory and not on reality. Through routes and joint rates between railroad lines and motor carriers have not developed and the idea has not proved attractive to those who use transportation, or to most of those in the business of furnishing it."*

It will be seen that the railroads' current answer to coordination is that they should be allowed to diversify by adding more motor carrier services. In other words, they will coordinate rail service and truck service provided they can perform it all themselves under common ownership. Diversification through common ownership is beyond the scope of this article; but it must be obvious that the adding of new services through diversification will not accomplish the objective of coordinating the existing services. The concept of coordination implies cooperation between differing, perhaps competing, modes of transportation.

Commissioner Kenneth H. Tuggle, as Chairman of the Interstate Commerce Commission, testified before the Senate Committee on Interstate and Foreign Commerce in 1959 as follows:

> *"Our considered view is that the present and future public interest requires that there be made available to shippers a ready choice of all modes of carriage and some workable method of flexibility whereby they can utilize the various inherent advantages of each mode in coordinated movements of single shipments. . . ."*

Commissioner Everett Hutchinson, the present Chairman of the Interstate Commerce Commission, spoke to the New York Society of Security Analysts on July 28, 1961. He was quoted as follows:

> *"Complete combination of services with all existing modes of transportation is the real key to the future. For the most part, railroads have been reluctant to make joint rates and through-route arrangements with independent motor carriers. In fact, only a few have gone against the tide of industry apathy and published joint rates with truckers."*

Altogether, it is abundantly clear that the attitude of the railroads toward joint rates with motor carriers has been one of apathy or opposition. Further evidence on the point would be merely cumulative.

Motor Carrier Viewpoints: Passive Acceptance

The viewpoint of the motor carrier industry toward joint rates with railroads is less clear. The motor carriers in recent years have been in vigorous opposition to some of the railroad piggyback plans, and apprehensive concerning others. The Doyle Report dated January 3, 1961, states that the American Trucking Associations, Inc., is opposed to Piggyback Plan V, which is the coordinated rail-truck joint-rate arrangement. It is understood that the A.T.A. position has changed recently to accept Plan V; but even so, it will take more than a belated attitude of passive acceptance to bring about the cooperation between rails and trucks necessary to develop a coordinated transportation system.

Of course, when we speak of the attitudes of the railroads or the motor carriers we should recognize that every industry is composed of many individuals and companies, and views will differ. Nevertheless, certain attitudes predominate and generally prevail. In light of the predominant attitudes of the carriers toward rail-truck joint rates, it is little wonder that the United States has not yet developed the coordinated national transpor-

tation system which is the goal of our National Transportation Policy.

A Program for the Future — First Step

So much for the past and the present. What can now be done to bring about coordination? How about a program for the future?

As a very small first step, the Interstate Commerce Act should be amended to give the Interstate Commerce Commission authority to require the establishment of through routes and joint rates between railroads and motor carriers whenever particular routes and rates are shown to be required in the public interest.

The Interstate Commerce Act provides that every railroad *shall* have the duty to establish reasonable through routes with other railroads; but as between railroads and motor carriers it provides only that the two modes *may* establish through routes with each other. There is no compulsion; it is purely permissive. Of course, railroads and motor carriers should not be required willy-nilly to establish joint rates with each other; there is too much diversity in motor carrier certificates and operations. However, the two modes should be required to establish joint rates where feasible and necessary. It is an anomaly of the present Act that the Interstate Commerce Commission is charged with the duty of coordinating the different modes of transportation in accordance with the National Transportation Policy, yet has no power to require establishment of through routes and joint rates between railroads and motor carriers. That anomaly should be removed by giving the Commission the power to establish any necessary through routes and joint rates.

Amendment of the Interstate Commerce Act as suggested would add substance to the National Transportation Policy, but would be only a small step toward coordination. True coordination between two modes of transport cannot be forced by legislation or regulation. Coordination requires cooperation; and cooperation requires that both partners have a genuine desire to cooperate.

The Basic Trouble: Automatic Antagonism

Intermodal competition still far overshadows efforts toward intermodal coordination. Why is there so little desire to cooperate and coordinate? Surely the men who make up the managements of American railroads and American truck lines are as honest, capable, reasonable and forward-looking as those in any other industry. I want to say that I think a major cause of the difficulty is that the two classes of carriers developed separately in point of time, the senior agency opposed the junior, the latter reacted in self-defense, and suspicions and antagonisms were engendered which have continued over the years. A small stream of antagonism which started 25 or 30 years ago has developed into a Grand Canyon, with the railroads on one side and the motor carriers on the other.

Meanwhile the trucking industry has matured, and a relationship between railroads and motor carriers which may have been appropriate in 1935 is no longer valid. It has not been valid for many years. Surely no one would question today that many highway carriers have the organization and resources to join responsibility with railroads in the movement of freight over through routes at joint rates and on a single bill of lading. Yet, the railroad viewpoint toward coordination with motor carriers seems to have changed very slowly and very little, and the motor carriers have responded accordingly. There has been a serious time lag in adjusting the viewpoint to fit the changed circumstances.

The basic trouble is that the railroad men think of themselves as railroad men, and the motor carrier men think of themselves as motor carrier men; and the men of each industry are conditioned through training and association to oppose the men of the other. The posture of antagonism has come to be automatic. The antagonists have been smart and resourceful, and have put up some interesting displays of force and counterforce. However, the cost has been too high and the public has

long since grown weary of the show.

The Big Step: A Common Carrier Association

The struggle should be brought to an end. What is needed now is a real change in thinking. Instead of thinking as a railroad industry and a trucking industry, the thinking should be as a common carrier industry. It usually takes a generation to develop a new thought pattern, but our common carrier industry can't afford so much time. The alternatives to early cooperation and coordination are too imminent and too ominous.

To get the responsible men of railroad transportation and motor carrier transportation to think of themselves as men in the same industry — common carriage — it is necessary to bring them together. Men get together and work together through organizations. Organizations which further the purpose of coordination should be encouraged. Organizations contrary to the purpose of coordinating the common carriers should be discouraged.

At the serious risk of offending some of my friends in the transportation business, for whom I have the highest regard, I raise the question whether there should continue to be railroad associations and trucking associations. Perhaps there should be common carrier associations instead.

In keeping with the trend toward consolidations and mergers, it is here suggested that the leaders in the common carrier industry take steps to amalgamate the Association of American Railroads with the American Trucking Associations, Inc., include the water carriers and freight forwarders, and form one new coordinated association — the Association of American Common Carriers.

The suggestion sounds fantastic, as is intended, but it is offered for its shock value. And it is important to ask why the suggestion sounds fantastic. The obvious reason is that

SECRETS OF TARIFF PUBLISHING

A short and pointed story

By M. R. Denney

(One aspect of establishing through routes and joint rates not covered by Mr. Bryant in the accompanying article is the problem of how the tariffs might be published. Herewith a tongue-in-cheek suggestion, which will strike a familiar chord in anyone who has ever read — or attempted to read — a tariff.)

J. Con Fusem, Publishing Officer for the West Atlantic Tariff Bureau, had just returned from vacation and his first act was to call for Tom Nauginloose, who for many years had been chief clerk in the publishing division.

"Well, what progress are we making in the publishing work, Tom?"

"Everything's fine, J. C. Everybody on the job, except we had a couple of changes. Had to let George Clear go. He let two bad ones get by and a rate clerk over on the A & P quoted the right rate the first time he looked. George simply couldn't get in the spirit of rate publishing."

"Good, Tom. We must uphold the dignity of our profession. How is Gertie doing?"

"She's turning out some pretty good ones. Here is one I thought you'd like to see:

'Applies to all commodities not named herein except as specifically not provided otherwise on commodities named but will not apply on commodities not specifically excepted under the provisions of this item.'

"Pretty good, don't you think?"

"Fair, Tom, but not long enough. See if she can't get a few more words in it and still make it look simple. She is using the old double and a half negative, but a lot of old time rate clerks can't be fooled on that any more. Maybe she could get in a one and a half positive. That ought to fix 'em."

"OK, Con. Right now she's working on a new intermediate provision, four pages long with nineteen exceptions, fourteen notes and seven references."

"Good! Give it to old Professor Crypto for checking."

"I did, Con. He gave it a score of 99. Said there was one phrase that was too clear or it would have been perfect. But I told her to leave it in."

"That's right, Tom. It's that occasional simplicity that really confuses them. I've just been looking at this magazine and I think these magazine publishers have some good ideas."

the Grand Canyon between the railroads and the motor carriers has grown so wide and so deep that it is difficult for us even to imagine railroads and motor carriers working harmoniously to develop a coordinated transportation system.

Nevertheless, the suggestion is more serious than facetious. Some drastic organizational realignments are necessary if thought patterns are to be changed from apartness to oneness, from antagonism to cooperation.

If it be objected that this suggestion may run afoul of anti-trust laws, then Congress should be invited to consider how the carriers can be expected to develop a coordinated national transportation system without first developing cooperation.

When cooperation and coordination on a broad scale get underway there may be many kinds of intermodal conferences and rate bureaus, perhaps even a single freight classification committee. Why not?

Alternatives to Coordination: A Gloomy Prospect

It may appear that these suggestions are an invitation to the railroads and motor carriers to forego their own economic self-interest in the public interest. Such is not the case. When it comes to development of a coordinated national transportation system, self-interest and the public interest are the same. The railroads and motor carriers must cooperate and coordinate if they are to prosper or even be assured of survival as private enterprises.

The short-range alternative to voluntary coordination may be a progressive loss of traffic to private and exempt trucks.

The final alternative to voluntary coordination may be the gloomy prospect of complete coordination accomplished at last through government ownership and operation of our common carrier transportation systems.

"What do you mean, Con?"

"Well, here is that phrase, 'to be continued'."

"You mean publish tariffs in serial form?"

"We're not quite ready for that, although we can set that as a goal. Can't you just imagine a rate clerk reading to the middle of an item and coming to the words 'to be continued'? This continued business looks good, the way the magazines do it. We start an item in the front of the tariff, then break it off and say 'continued on page 537', for instance, and then they have to turn to that page. For variety, we can occasionally throw in 'this page intentionally left blank' on the continued page. Let's get started on it. The serials can come later. Now, how about reference marks and symbols?"

"Two of the boys are doing pretty good on that. Jack came up with a triangle inside of a circle inside of a square with three figures inside the triangle. A beautiful job, but it's going to cost a little more to print. Seems like the printers are having a little trouble casting type small enough."

"Well, Tom, keep them working on it. You know my wife owns some stock in that new optical company. Is Bill back yet?"

"Con, I'm sorry, but I had to let Bill go, too. Before we caught it he used a reference mark to mean the same thing in three different tariffs."

"You did right, Tom. Anyone should know that a reference mark should never mean the same thing twice. Be sure you haven't slipped up on the symbols for 'not subject to Item X-223'."

"We've done all right on that. We've got 341 symbols, so far."

"But don't we publish 342 tariffs?"

"Right, Con. But one tariff has only one item in it. We have to add another item next month and we'll make one of the items not subject."

"Well, Tom, everything seems to be going pretty good, but we get into a rut on symbols. We've got to get away from the geometrical shapes. Too conventional, and every tariff bureau in the country has used them all, with variations. We need a new approach. I've often thought about Chinese letters or numbers, but there might be a rate clerk somewhere that knows Chinese."

"Wait a minute, Con. I'll be right back."

In a moment Joe returned and spread out on the desk a large sheet covered with hundreds of odd symbols.

"What's this, Tom? Looks interesting."

"Well, it seems that Mabel was visiting this dude ranch, and she bought this chart of cattle brands and she wondered if——" (to be continued).

TM Douglas Day of S & W and GTM Ralph Coffing of Di Giorgio study in-transit damage to rail shipments and develop

A new method for loading and bracing palletized shipments

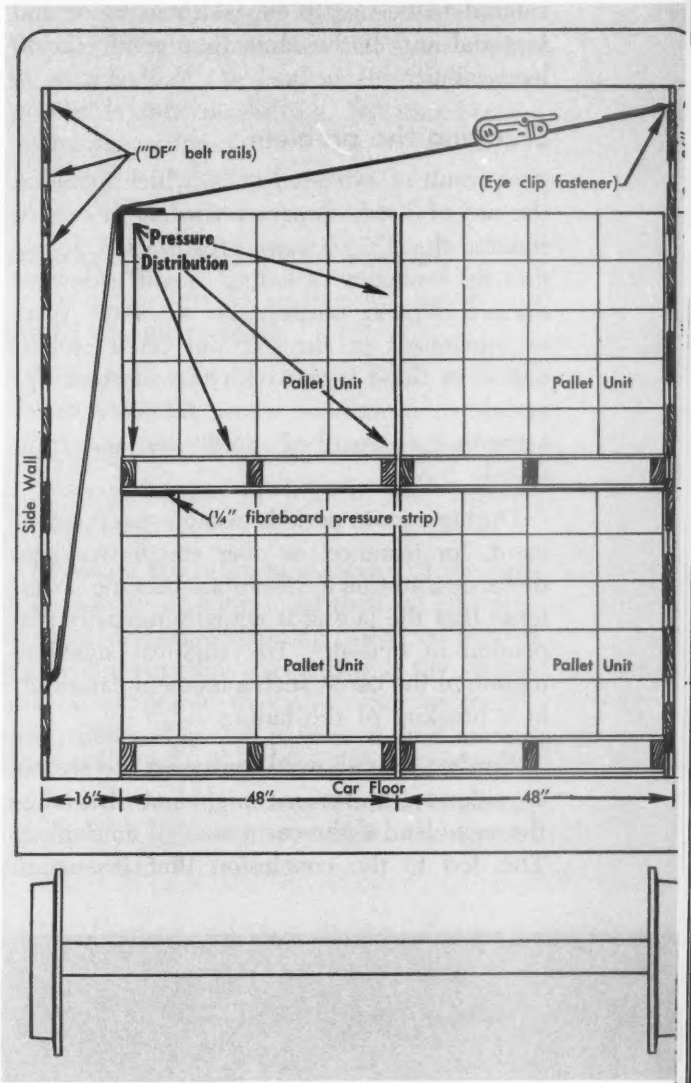
The Di Giorgio Fruit Corp. of San Francisco and its S & W Fine Foods subsidiary as volume shippers of canned goods faced these problems in making rail shipments of their products:

1. Pallet size. The 40 & 48″ pallet which has become more or less standard in the canning industry does not lend itself well to stowage in a standard insulated box car with an approximate width of 112″. Two pallets loaded abreast occupy a lateral area of about 96″, leaving a void area of up to 16″ between the pallet unit and the car's side wall.

2. Double stacking problems. Difficulties of stowing palletized canned goods in box cars have led to a general practice of limiting loading to a single layer of palletized units. In order to meet the 75,000 lb. carload minimum applicable to most destinations, single layer pallet loading necessitates stacking each pallet with an unusually high cube of lading. While these oversize units – sometimes run-

ning to 3,500 and 4,000 lbs. – can be handled with carloading fork lift equipment at origin and destination, they are sometimes too large in cube for satisfactory warehouse storage, particularly where storage racks are used, and consequently must be broken down before storage.

Straps used in Di Giorgio carloading system have ratchet buckle attached, can be adapted for belt rails of Evans DF cars, using eye clip and fastener (hanging down) or for Car-Pac Loader type cars, using key-locking end fastener (in position).



3. Limitations of existing methods. The company found that device rail equipment effectively controlled lengthwise shifts of lading, but that there was no satisfactory method of controlling sideways shifts or up-and-down "bouncing." One method which was partially successful was to fill the empty areas in the car with wooden dunnage. Another was to stow pallets against opposite walls and to place a series of wooden gates or braces against the face of the pallet units, securing these gates in place by means of steel strapping anchored to the side walls and surrounding the load lengthwise. For the Di Giorgio – S & W operation, these methods were con-

sidered to be overly expensive in labor and material and at the same time conducive to load failures.

Studying the problem

As a result of extended tests, which included the use of 3-way impact recorders in cars in transit, the Di Giorgio organization found that the tendency of lading to shift sideways doesn't depend entirely on sideways sway or movement of the car but on a combination of these forces with the constant up-and-down movement whose intensity varies according to roadbed conditions and train speed.

During certain periods of high-speed movement, for instance, or over rough trackage, these up-and-down vibrations become so intense that the lading is actually partially suspended in mid-air. The slightest sideways motion of the car at such a moment can result in a breakup of the lading.

Further tests showed that even the strongest sideways movement might not disarrange the same load if the car remained motionless. This led to the conclusion that if enough downward pressure could be applied to the lading it would counteract the up-and-down vibrations and thus prevent sideways shift of the lading.

With these findings in hand, Messrs. Day and Coffing undertook further test shipments using a series of flexible belts to apply downward pressure on the lading. This was the beginning of the "Di Giorgio Method," for they found that in each test shipment the lading arrived in excellent condition and unloading was performed quickly and efficiently with fork lift equipment. They were further able to demonstrate the system's flexibility by using it successfully in a carload shipment consisting of a mixture of different size pallets with varying cubes.

How the Di Giorgio method works: Basic equipment for the Di Giorgio loading method is: a "DF" box car; 10 cotton or dacron web straps equipped with end snaps and ratchet-type buckles; hinged wooden guards made of rough lumber with fabric strap hinges; and 10 narrow strips of corrugated board.

Pallet units are loaded two high (one, if preferred) and two deep against one side wall

LOADING AND BRACING PALLETIZED SHIPMENTS — THE DI GIORGIO METHOD: (1) The palletized canned goods are loaded flush against the right wall of the DF car. Straps are attached to bottom belt rail, clipped temporarily to top rail as shown to keep them out of the way during loading operations. When pallet units are in place they will be unclipped from top belt rail on left wall and drawn across outer edge of load, then attached to top rail on right wall. Note cardboard strips leaning against wall, to be used as "wedges" between outer edges of pallet loads. (2) Workman atop load draws strap

of the car leaving a void area running lengthwise along the facing wall. The straps are attached to the bottom belt rail in this area, drawn up over the outer edge of the top pallet unit and attached to the top belt rail on the opposite wall. By securing 4 pallet units with each strap, 10 straps will take care of a carload of 40 pallet units with a gross weight from 75,000 to 90,000 lbs.

The hinged wooden guards are placed along the edges of the uppermost, outermost cases, so that when the strap is tensioned its pressure will be spread along the entire outer edge of the pallet unit.

A strip of corrugated board is inserted between the top and bottom pallet units next to the void area to insure maximum pressure when the strapping is tensioned.

After each tier is loaded and the straps are in place, maximum tension is applied to each strap, using the hand ratchet mechanism. As shown in the drawing, this tensioning exerts pressure downward, diagonally and sideways in a pattern depending on the angle of the strap at the point of contact with the hinged guards.

The final step is put in place the conventional "DF" cross members and gates applied to each half of the load at the doorway to prevent lengthwise shifting. No other bracing or dunnage is used.

Advantages claimed for method

The originators claims these advantages for the Di Giorgio method:

1. Reduction of carloading labor and material costs.
2. Reduction of damage in transit.
3. Simplification of loading and bracing methods.

Although the primary objective of the program was to develop a satisfactory and economical method of shipping palletized canned goods, the company foresees that the system will be adaptable to many other commodities, palletized or not palletized, and toward that end is licensing use of the Di Giorgio method through its transportation engineering division, which also markets the special straps used in the system.

over hinged V-board running entire length of pallet load. Made of rough lumber and hinged with fabric straps, V-boards protect carton edges and help distribute pressure from strap across entire pallet load. (3) Closeup shows straps in position across lading and attached to top belt rail on right wall; workman is increasing tension using hand ratchet buckle. (4) The same action seen at a distance. The half-load is now complete, all strapping is in position and tensioned and all that remains to be done is to position gates and cross members.

How does rental differ from leasing?

"From a legal and tax viewpoint, there isn't much difference between a true leasing contract and a rental contract."

"But from a practical viewpoint, there is one important difference. That's who does the maintenance. In a rental contract, the renting company (lessor) takes care of all maintenance and servicing. You, as the customer (lessee), are free of maintenance responsibility. In a leasing contract, as a rule, you assume the problems of maintenance, just as if you bought the equipment outright."

Herbert A. Warren, General Manager
Clark Rental Corporation, New York

Herbert A. Warren, general manager of Clark Rental Corp. and himself a CPA, tops off his argument for the advantages of long-term renting of handling equipment with a chart which will help determine

THE COST OF OWNING HANDLING EQUIPMENT

Like any other element of a physical distribution system, a material handling installation is designed to render a predetermined level of service at minimum cost. Any further approaches to material handling should not, however, be so biased in favor of cost-reduction that the possibilities of service level improvement are overlooked.

These two questions should always be asked:

1. "Can we do the same job at less cost?
2. "Can we do a better job for the same cost?"

In a cogent argument in behalf of long-term equipment rental, Mr. Warren supplies some answers to both questions. From the cost-reduction point of view, he offers a chart for calculating ownership costs, which may then be compared with the costs of long-term rental, or full-service leasing, as it is sometimes called. From the service-improvement standpoint, he points out that the renting company assumes responsibility for providing (and maintaining) the best equipment available to do the most efficient job possible, and for providing the proper number of units, steps which often require revisions in the customer's material handling system to correct practices that are inefficient or outdated.

Mr. Warren's cost chart is reprinted on the following pages. Obviously, not all entries will apply to all companies, nor can all items of overhead expense be automatically eliminated by switching from equipment ownership to long term rental. But the possibility should be considered that time, labor and plant represented by these overhead expenses might be used to improve service levels.

While the advantages and disadvantages of renting vs. owning must necessarily be decided case by case and company by company, a realistic cost-and-service analysis applied to material handling will often benefit the entire physical distribution system.

MATERIAL HANDLING EQUIPMENT COST COMPARISON CHART — RENTAL VS. OWNERSHIP

1. COST PROJECTION UNDER OWNERSHIP

COST OF EQUIPMENT

Include cost of equipment and accessories (new or leaseback), transportation charges, sales taxes, etc., (less residual at end of term) $_____

COST OF BORROWED CAPITAL

Include all interest (or financing charges) on capital tied up in equipment ..... $_____

MAINTENANCE COSTS

If you maintain a repair shop—

Include all direct and indirect shop costs such as payroll costs, fringe benefits, rent, light, heat and power, depreciation of shop equipment, tools, insurance, record keeping, etc. Also include all outside repair service, tire replacement, purchases of parts, etc. .. $_____

If you do not have a repair shop—

Include charges for outside service calls, parts, preventive maintenance, emergency calls, overhauls, tire replacement, painting, steam cleaning, etc. ..... $_____

NOTE: All costs, compiled from your records for past years, should be adjusted to current price levels.

COST OF INSURANCE

Include both fire and theft, etc. ..... $_____

TAXES

Include personal property, excise, use, etc. .. $_____

OTHER OVERHEAD COSTS

Purchasing Department

Include cost of interviewing salesmen, evaluating equipment, issuing purhcase orders, record keeping, etc. ..... $_____

NOTE: A recent survey by an independent research organization reveals that the average cost of processing and receiving orders for maintenance parts was found to be not less than $20.00 an order.

Receiving Department

Include cost of checking replacement parts received, preparing receiving reports, following up material, record keeping, etc. ..... $_____

Stores Expense

Include cost of receiving parts and supplies, stocking and issuing of parts, physical inventorying, record keeping, etc. ..... $_____

Accounting Department

Include cost of checking invoices, posting of books, accounts payable, cost accounting, etc. ..... $_____

Management Time

Include cost of supervising the materials handling operation, purchase of equipment, etc. ..... $_____

LOSSES TO DOWNTIME

Include losses to idle personnel, production stoppages, shipping delays, costs of renting substitute equipment on short term, cost of owning and maintaining stand-by equipment, etc. ..... $_____

NOTE: According to the results of a survey of representative industrial plants made by an independent research organization, the cost of unscheduled downtown ranged from a maximum of $1,770 per hour to a low of $1.50. The arithmetic average of all responses was $54.50 per hour. Omitting the highest figure of $1,770, the average was $16.28.

LOSSES TO RISING COSTS

To cover estimated increases in price levels for labor, parts and overhead ..... $_____

NOTE: Hourly labor rates for "All Manufacturing" according to the Bureau of Labor Statistics have increased at an average of better than 5% annually over the past several years. Similar rates of increases have been experienced for the cost of parts, supplies, fringe benefits and other overhead items.

OBSOLESCENCE

This is to cover both equipment and parts .... $_____

NOTE: No provision need be made where a complete fleet is being replaced, and retirement contemplated within normal economic life of new equipment, since obsolescence exposures will probably be normal. Where either all or part of existing equipment is to be continued in operation, efficiency thereof should be compared with equipment of current manufacture.

PROFITS LOST

This is to cover profits lost by capital tied up in equipment ..... $_____

NOTE: Additional profits to be earned, by investing funds freed by renting into the production of company product, can be determined as follows: Funds tied up in equipment times annual turnover rate of capital times annual profits ratio equals extra profits to be earned.

OTHER COSTS

This is to include all other valid costs including lost manhours (caused by illness, training, etc.), losses to pilferage of parts and tools, etc. $_____

TOTAL PROJECTED COST OF OWNERSHIP ..... $_____

2. TOTAL COST OF RENTING

This amount to be supplied by rental company after survey is completed ..... $_____

DIFFERENCE ..... $_____

Volkswagen's use of containers for overseas parts shipments reduced some costs, increased others, but added an important ingredient: better sales-service

Volkswagen's 5-ton containers, leased from North American Van Lines, move to shipside in Hamburg via rail. Volkswagen has used container systems extensively in supplying its European assembly plants, first started large-scale overseas containerization in late 1960.

CONTAINERIZATION MAY C

In outlining his company's containerization program at the recent ICHCA conference (T & D M, October, 1961, p. 33), Guenter Kittel, general parts manager, Volkswagen of America, Inc., described a series of test programs undertaken by the company to determine whether containerization of its U. S. parts shipments would offer advantages over the existing method using nailed wooden crates with waterproof liners.

From these test programs, certain important plus and minus factors emerge:

1. REGULARITY AND VOLUME OF SHIPMENTS

The initial tests made by Volkswagen in 1956 made it immediately clear that an uneven volume of shipments from month to month made containerization impracticable. By 1959, parts shipments had become so regular and in such volume that another test was made, using 6 metal containers with capacities ranging from 5 to 15 tons.

2. TRANSPORTATION FACTORS

The 1959 program was abandoned when it was discovered that the containers could not be returned to the factory fast enough to present any savings over the wooden boxes. In 1960 another test program was started, using 5- and 10-ton containers supplied by North American Van Lines and transported by them to Volkswagen's 16 distributors throughout the U. S. An important factor here was that North American would pick up the empty containers at each distributor's location for return to the factory in Germany.

This test program proved the value of containerization, and in October of 1960 Volkswagen started a large scale use of containers, shipping a total of 143. By the end of July, 1961, the company had shipped a total of 2024 metal containers.

On the negative side in the transportation picture, however, is the problem of suitable return loads to fill the containers for the shipment back to Germany. Household goods of American service personnel make the best cargoes, says Mr. Kittel, but such shipments are not always available, and frequently a number of empty containers are waiting at Stateside piers when they are needed for the regular flow of parts shipments from Germany. In the period from October, 1960, through July, 1961, Volkswagen had to use 799 wooden boxes of 5-ton capacity in addition to its metal containers, at times when the containers were not available in Germany. The company is now considering using containers for shipments of exchange engines, transmissions and small parts, utilizing the same containers for shipping used units back to Germany for reconditioning. Such built-in two-way traffic would of course eliminate the return load problem for this segment of the business.

3. HANDLING AND SHIPPING

Because almost all items have to be prepackaged at the factory before containerization, the Volkswagen program has necessitated more factory space, more personnel and a 300% increase in the use of high quality cartons. Heavier cranes and lift trucks are needed for handling containers at both ends of the voyage, another additional expense. However, the containers themselves are loaded very rapidly with the prepackaged parts, and loading the containers aboard freight cars requires only a half hour, as compared with the 2 to 3 hours formerly required to load the various smaller boxes. There are savings at the receiving end, too. One U. S. distributor, World Wide Autos Corp., estimates that use of the containers has reduced its warehouse handling time and costs by approximately 40%.

AY COST MORE, BUT...

First containerized shipment of parts to arrive in U. S. from Volkswagen plant in Wolfsburg, Germany, is opened by Stanley Hopwood, parts manager of World-Wide Autos Co., one of 16 Volkswagen distributors in U. S., as North American Van Lines vice president George Smith (left) and Volkswagen parts manager Guenter Kittel look on.

4. LOSS-DAMAGE EXPERIENCE

Although it is felt in some quarters that loss-damage figures for containerized shipments are over-optimistic and based on insufficient experience, the Volkswagen program has resulted in a minimum of damage. Part of the credit for this, however, should be attributed to the fact that Volkswagen uses experienced and skilled workers to fill the containers. The fact that the containers are airtight and waterproof is also important with automobile parts susceptible to water and moisture damage, while the fact that containers remain locked from origin to destination does away with pilferage.

5. MEASUREMENT OF COSTS

The increased prepackaging and handling

costs are offset by these factors: elimination of a large inventory of wooden boxes of various sizes and of the nailing, marking and strapping operation; time saved in filling containers and loading aboard freight cars; lower cost for leasing containers than for building a wooden box of the same size; and handling and storage savings by distributors. However, says Mr. Kittel, *"If we consider the cost of prepacking in the over-all shipping cost, the total is about the same as was our previous cost using smaller boxes."*

Unloading containerized parts shipment. Prepackaged parts can be reshipped in original cartons by Volkswagen distributors, a particularly attractive feature of the containerized system, according to parts manager Guenter Kittel. Another feature is that waterproof, locking containers can be used for temporary outside storage.

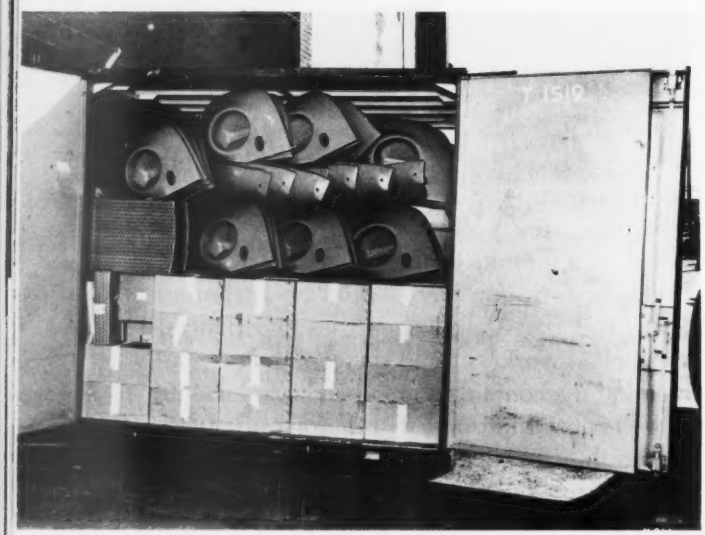


Photo shows how Volkswagen combines prepackaged parts with fenders packed loose, requiring only dividers to prevent scratching. Distributors are saving as much as 40% in warehousing and handling time and expense, says company. Loss and damage has been reduced to virtually nothing. Finding return loads for shipment to Germany is still problem, causes troublesome delays.

6. EVALUATING THE PROGRAM

Obviously the cost factor in itself was not enough to justify Volkswagen's switching to containerization for its overseas parts shipments. As Mr. Kittel explains it:

"The value of the program is not in the money saved, but in the time saved. The factory looks upon this program as worth while because of the greater satisfaction that results from quick handling of parts orders.

"About 90% of the total weight of all parts shipped to the U. S. is now in containers. About 80% of all parts are prepacked — a definite cost saving to our distributors who can re-ship them to the dealers without repackaging.

"Our containerization experience has been very good."

Some Facts and Figures on the Volkswagen Containerization Program

Volkswagen uses its leased container system to supply its 16 U. S. distributors through these ports: New York, Philadelphia, Boston, Baltimore, Chicago, Toledo, Jacksonville, New Orleans, Los Angeles, Houston, San Francisco, Portland, Seattle, Honolulu.

Containers utilized are leased from North American Van Lines, Inc., and have outside dimensions of 84″ width, 102″ length and 82″. The steel containers have a capacity of 384 cubic feet, or 10,000 lbs.

Before switching to containers, Volkswagen was shipping a peak of 3,500 nailed wooden boxes of parts monthly. By the time the containerization program got underway, that figure had dropped to 833.

From October, 1960, through July, 1961, Volkswagen's U. S. parts shipments had totaled 2,024 metal containers and 799 wooden boxes of 5-ton capacity, used when containers were not available in Germany.

About 90% of the total weight of all parts shipped to the U. S. is now containerized, and about 80% of all parts are prepackaged.

Material Handling IDEAS

NEW EQUIPMENT
NEW INSTALLATIONS
NEW APPLICATIONS
A MONTHLY REVIEW

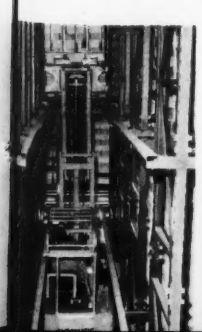
Who buys the handling equipment in your company? There's every indication of a trend away from single-manager responsibility in this area. An investigation into 332 major companies reveals that 4 and sometimes 5 departments are regularly involved in purchases of material handling equipment for non-production line use. Most frequently mentioned, though not always in the same order: Purchasing, Engineering, Traffic and Production. There are some reasonable administrative arguments against having responsibility for the function scattered about among different departments, but the arguments should be just as strong against selecting material handling equipment without a fair amount of give-and-take among the departments concerned.

This is particularly true in the case of more complex handling systems, but it can be just as true in the case of a single fork lift truck that has to double in brass for Manufacturing and Shipping but can't be maneuvered inside a box car, or one that works fine in a box car but that doesn't have enough reach for temporary storage racks in the manufacturing area. When situations like this are described, they are usually prefaced with the words, "You wouldn't believe it could happen, but . . ." This is the best argument we know for getting into the material handling act if you're not already in it, or for seeing that all bases are covered if you're now handling it as a one-man proposition.

These safety tips for electric lift truck servicing or troubleshooting are offered by Clark Equipment Co.: 1) Remove all jewelry; a ring or watch brushing against a contactor can cause a serious burn. 2) Raise drive wheels off floor by placing blocks or timber under truck's uprights, then tilt upright forward. 3) Clean truck and work area. Use moisture-free compressed air to clean contactors and other components. 4) Disconnect the battery. It can be connected quickly when power is needed for testing.

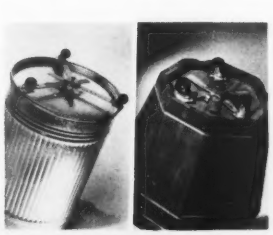
(You may secure additional information about these recently-announced items of material handling equipment by circling the key number, indicated in parentheses after each item, on the "Distribution Data" business reply card in this issue.)

Drive-in rack boosts storage capacity. Automatic Transportation Co. describes drive-in storage racks suitable for storage systems utilizing last in, first out sequence and compatible with the company's 40" wide, 4000-lb. capacity ELF-40 electric truck, which actually enters the rack and drives to the end to deposit the load. Until filled, each section of the rack serves as an aisle. (No. 150) *Portable pneumatic conveyors* for bulk handling of grain, plastics and other granular or pelleted materials have been introduced by The Buhler Corp. in two capacities, 12 tons per hour and 25 tons per hour. The manufacturer says the new conveyors are more efficient than most other portable pneumatic units because they employ a positive displacement blower rather than the conventional multi-stage fans, enabling them to deliver more tons per hour using less power and using small-diameter conveying lines, an advantage in working in close quarters or when it is necessary to route lines around sharp corners. (No. 151) *A dolly for cans, tubs and bins* weighing up to 100 lbs. has been introduced by Pemko Manufacturing Co. The new dolly is adjustable to various diameters, and also attaches so that it won't fall off, through a single screw setting. Large model extends to 23", small model to 16". (No. 152) *5½-lb. stretcher* for strapping of heavy duty round or irregular shaped units, skids and pallets, truck and carloads, has been introduced by A. J. Gerrard & Co. Unit speeds tensioning of ¾" and 1¼" x .035" strapping, says manufacturer, and 230° arc makes it easy to tension strap in close quarters. (No 153) *Barrel and box grab,* standard item from Palmer-Shile, comes in two sizes, 1,000-lb. capacity and maximum container 25" in diameter, and 2,000-lb. capacity and maximum container up to 40" in diameter. Firm's *barrel cradle* has 1,000-lb. capacity, can be used on any cylindrical material. (No. 154) *40-lb. winch with 6 or 12 volt motor* which handles 2¾-ton loads at speed range of 1 to 12.5 fpm utilizing Nylon web, 8,000-lb. test belt providing 22-ft. stroke, is announced by Scocor, Inc., which says its "Autowinch" is designed for transportation, warehousing and marina operations. (No. 155)



DRIVE-IN RACK

5½-LB. STRETCHER



TUB & BIN DOLLY,

40-LB. WINCH

BARREL CRADLE

BARREL & BOX GRAB

Some applications for

Multi-purpose Corrugated Containers

Kaiser and Westinghouse both find economy and versatility in containers for shipment, storage and in-plant handling

SOLA: solving a handling, packaging problem

Early this year, Sola Electric Co. announced that it had solved a packaging and material problem handling by developing lightweight palletized corrugated cartons for shipping and storage of its 600-lb. constant voltage regulators and transformers. The containers, shown in the illustration to the left, can be stacked three-high in storage, individually withstand weights up to 2,000 lbs. Electrical units and container are bolted to expendable pallet base. Handling ease, damage-free transit record and protection from moisture were cited by company as particular advantages of system.

More recently, Kaiser Refractories division of Kaiser Aluminum & Chemical Corp. reported the development of a "revolutionary" self-dispensing hopper bottom container for shipping and dispensing refractory and gunning mixes for use by the steel industry in open-hearth and electric furnaces.

The new container, developed by Kaiser and Corrugated Container Co. as an alternative to sacks previously used in shipment, consists of an outer triple-walled corrugated box securely mounted on a wooden pallet. Inside the outer carton are two inner containers each with a capacity of 1,000 lbs. of ramming or gunning mix. Each inner container has its own exclusive bottom spout, so that it can be dumped separately from, or simultaneously with, the other inner container into a mixer or pneumatic gun hopper. Each container has a built-in barrier to protect the product from moisture; the spout is formed by pulling a tear strip or "zipper."

DISTRIBUTION DATA to send for

(000) Circle this number on business reply card — help us and advertisers by only requesting information you are interested in and can use!

see other side of card for new products, literature, and services and products of advertisers.

MATERIAL HANDLING CASE HISTORIES

127 *Harry J. Ferguson Co.:* Handling of express shipments to and from highway trucks and trailers at REA Express' new Garden City, L. I. terminal; shipments are marked, sorted and weighed while moving at 100 fpm.

128 *Disogrin Industries:* "Disowheel," a urethane material handling truck wheel, used on equipment at Sweetheart Cup Corp.'s Los Angeles plant has permitted $3,000 saving in floor repair costs and fewer wheel replacements.

129 *Yale & Towne Mfg. Co.:* Savings, not time in use, are the prime factor in deciding on equipment use at Newark, Del., plant of Natl. Vulcanized Fibre Co., where lift truck is in use only 20% of time.

130 *Hyster Co.:* Produce warehouse of Thriftimart, Inc., Los Angeles, uses lift truck with carton clamp to "outwork" 5-man warehouse crew.

131 *Drott Mfg. Corp.:* Largest rubber tired lift in the world, with 50-ton capacity, is used in lifting, transporting and precision positioning of rocket segments at United Technology Corp., San Jose, Calif.

132 *Oxy-Catalyst, Inc.:* Installation of exhaust purifiers on gasoline powered lift trucks used by Hillbro Co., Los Angeles, to store bulk paper in a confined area has reduced monoxide concentrations to safer levels, increased employee morale and efficiency.

133 *Conveyor Systems, Inc.:* Conveyorized order-picking for a larger Chicago wholesale drug firm, utilizing double-decked roller conveyors carrying order baskets and traveling from floor to floor by means of a combination of gravity roller conveyor and spiral chutes.

PACKAGING/PACKING SHIPPING ROOM

134 *Glue Fast Eqpt. Co.:* Use of label gluer permits use of tabulating punch cards (IBM, Remington Rand, Globe Ticket, etc.) as address label for case shipments by wholesale drug firm.

135 *Wirebound Box Div., St. Regis Paper Co.:* Uses of wirebound boxes to pack portable air compressors, heavy ammonia valves, kitchen counter tops, centrifugal fans, magnet wire and gas fired boilers.

136 *Multistamp Co.:* Use of stencil addressing system at Johnson & Johnson's North Brunswick, N.J. Shipping Center has increased package-addressing capacity to 18,000 units per day, reduced errors in addressing.

137 *Orchard Paper Co.:* 15 brief case histories involving use of cohesive paper in protective packaging operations include packaging of curved windshields, parts, chairs, tools, glass items, handle bars and aluminum railings.

138 *Union Carbide Corp., Bldg. Materails Dept.:* Material handling, packaging and preshipment inspection time cut by use of polyethylene film as protective covering for storing and shipping, at cost savings up to 90% of previous methods.

SPECIAL TRANSPORT EQUIPMENT

139 *Pullman - Standard:* Shipments of whiskey and food products in "Compartmentizer" cars; shipments of newsprint and automobile blass in "Hydroframe 60" cars.

140 *Young Spring & Wire Corp.:* Performance and maintenance history of special "yard jockety" used by Cincinnati-based common carrier.

CASE HISTORIES & APPLICATIONS

141 *Kalamazoo Mfg. Co.:* Use of firm's "Speed Truck" in Kellog Company's warehousing and transportation operation to service fork lifts with fuel, oil and water, eliminating necessity of driving equipment to service center.

142 *Cushman Motors:* Cost analysis of 28 uses of firm's "Truckster" units for industrial and commercial uses in moving of goods and personnel.

LITERATURE

143 *Union Asbestos & Rubber, Eqpt. Specialties Div.:* "Divide Loads — Conquer Costs" brochure describes firm's "Equipco" load dividers, a split bulkhead type of damage prevention device for rail cars.

144 *Automatic Transportation Co.:* "Which Is Best For You?" is title of 12-page booklet discussing relatixe merits of purchase, lease or rental of lift trucks.

PLEASE SEND MORE INFORMATION ABOUT—

CASE HISTORIES & APPLICATIONS

127	135	143
128	136	144
129	137	145
130	138	146
131	139	147
132	140	148
133	141	149
134	142	

PRODUCTS DESCRIBED EDITORIALLY

150	160	170
151	161	171
152	162	172
153	163	173
154	164	174
155	165	175
156	166	176
157	167	177
158	168	
159	169	

(This card good until December 31, 1961)

WE CANNOT SERVICE YOUR REQUEST UNLESS THE FOLLOWING INFORMATION IS COMPLETE!

Name.....Title.....

Company.....Products.....

Address.....City.....Zone.....State.....

☐ *Please check here if you are not receiving your personal copy of T & D M and would like to receive it regularly, free of charge.*

FIRST CLASS
PERMIT NO. 5281-R
WASHINGTON, D.C.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

T&DM

815 WASHINGTON BUILDING
WASHINGTON 5, D.C.

DISTRIBUTION DATA to send for

000 Circle this number on business reply card — help us and advertisers by only requesting information you are interested in and can use!

145 *Herculite Protective Fabrics:* "Packaging and Materials Handling Manual" is 27-pg. booklet describing firm's suspension system for packaging irregularly shaped and difficult-to-pack items. Numerous engineering drawings and tables.

146 *New York Central Railroad Co.:* "Operation Turnqey" describes railroad's plant location services, discusses ownership vs. leasing and other questions.

147 *Cleveland Electric Illuminating Co.:* "Add More Talent to Your Thinking about the Problem of Industrial Expansion" introduces members of area development staff, describes plant location and expansion services.

148 *Paslode Co.:* 20-pg. booklet describes and illustrates firm's line of industrial stapling tools.

149 *Spotnails, Inc.:* 16-pg. catalog of company's line of portable nailing tools.

See other side for case history and application material to send for.

PRODUCTS DESCRIBED EDITORIALLY

MATERIAL HANDLING IDEAS, pg. 35

150 *Automatic Transportation Co.:* Drive-in storage racks for last-in, first out sequence.

151 *Buhler Corp.:* Portable pneumatic conveyors for bulk handling of grain, plastics, etc.

152 *Pemko Mfg. Co.:* Adjustable dolly for cans, tubs and bins weighing up to 100 lbs.

153 *A. J. Gerrard & Co.:* Stretcher for strapping round or irregular shaped units.

154 *Palmer-Shile:* Standard barrel and box grab, barrel cradle.

155 *Scocor, Inc.:* 40-lb. 6- or 12-volt powered winch handles 2¼-ton loads.

NEW PRODUCTS AND SERVICES — INFORMATION FROM ADVERTISERS

PACKAGING/PACKING, SHIPPING ROOM IDEAS, pg. 41

156 *Dazzo Products, Inc.:* Retractable dock-door shelters to protect loading dock areas.

157 *Polyspand, Inc.:* Protective corners for interior cushioning in shipments.

158 *Better Packages, Inc.:* Booklet on packing and shipping operations.

159 *Fastener Corp.:* Staple nailer for securing corrugated to wood.

160 *Brooks & Perkins, Inc.:* Aluminum pallet for assembly by user.

161 *Container Stapling Corp.:* Units staples tops & bottoms of packed boxes simultaneously.

162 *Remmele Engineering, Inc.:* Conduit and tube bundler uses pressure-sensitive tape.

163 *Pac-Tron, Inc.:* Re-usable complex pack distributes shock loads equally to all sides.

DISTRIBUTION MANAGEMENT TIPS pg. 7 & 42

164 *Bell Telephone System:* Line switched teletype system in use by airline.

165 *Digitronics Corp.:* Paper tape terminals for transmisison of 1,000 words per minute.

166 *Diamond Electronics:* Closed-circuit TV for warehouse and terminal area surveillance.

167 *Atkinson Dynamics:* Intercom system designed for high noise areas.

168 *Duchart, Inc.:* Kit for making bar, pie, line and other types of graphs and charts.

FORK LIFT ATTACHMENTS, pg. 14

169 *Automatic Transportation Co.:* 3 types of attachments, rotating device.

170 *Silent Crane & Hoist Co.:* Heavy duty equipment with detachable ram, crane.

171 *Baker Industrial Trucks Div.:* Boom attachment with remote control, "Multi-Handler."

172 *The Raymond Corp.:* Hydraulically adjustable forks, special forks for cello rolls.

173 *Allis-Chalmers Mfg. Co.:* Hydraulic carton clamp for picking up closely-packed unit loads.

174 *Towmotor Corp.:* (Gerlinger) Adaptation for carrying pipe sections in multi-unit loads.

175 *Towmotor Corp.:* Tilting mast permits high stacking in narrow aisles.

176 *Lewis-Shepard:* Side-shifter saves "hours" for public warehouse.

177 *The Raymond Corp.:* Narrow-aisle fork lift with thin chisel forks.

FIRST CLASS
PERMIT NO. 5281-R
WASHINGTON, D.C.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

T&DM

815 WASHINGTON BUILDING
WASHINGTON 5, D.C.

PLEASE SEND MORE INFORMATION ABOUT—

CASE HISTORIES & APPLICATIONS

127	135	143
128	136	144
129	137	145
130	138	146
131	139	147
132	140	148
133	141	149
134	142	

PRODUCTS DESCRIBED EDITORIALLY

150	160	170
151	161	171
152	162	172
153	163	173
154	164	174
155	165	175
156	166	176
157	167	177
158	168	
159	169	

(This card good until December 31, 1961)

WE CANNOT SERVICE YOUR REQUEST UNLESS THE FOLLOWING INFORMATION IS COMPLETE!

Name.....Title.....

Company.....Products.....

Address.....City.....Zone.....State.....

☐ *Please check here if you are not receiving your personal copy of T & D M and would like to receive it regularly, free of charge.*

The container – caller "Kaiser-Pak" – is transported by lift truck to a position over the mixer or gun. The operator discharges the product by pulling the tear strips, filling a 2,000-lb. capacity gun in about 3 minutes. Kaiser says that its container has been designed to suit conditions in most open-hearth floors. The bottom pallet measures 36 x 32" and the carton is 43" high, a height that can be varied according to product density. The container makes possible a longer storage period, says the company, reduces the loss normally experienced from sack breakage during handling and permits clean dumping, utilizing all the material in the container.

Westinghouse containers have hinged gate, are reusable

Along similar lines, Tri-Wall Containers has developed for the Westinghouse Lamp Division plant in Belleville, N. J., a corrugated container which performs 3 interrelated jobs: first, as a receptacle and pouring bin for aluminum and brass light bulb bases; second, as containers for the bases in interplant shipment; third, as storage devices.

The containers, which measure 48x42x30", are received flat and attached to wooden pallets with a special magnetized nailing rod. In the Belleville operation, the metal light bulb bases descend from a funneled chute into a series of the containers, which hold 70,000 of the metal parts at brim level, with a gross weight of 732 lbs.

Transferred to a storage area, the containers are stacked three or four high. From the storage area they are truck-loaded for transfer to the company's plant in Trenton, 60 miles distant. There, each container in turn is fork-lifted onto a rack and tilted to permit the bulb bases to pour out into a hopper for further processing. A pre-built hinged gate in the container provides a swinging door through which the bases can be emptied rapidly. The container is then returned to Belleville for repeated use.

George C. Stryker, material handling engineer of the lamp division, says that the containers are holding up 3 and 4 times longer than was expected.

KAISER: 1. Zipping the zipper

"Considering the heavy duty they were asked to perform," he says, "we figured on a 3-month life for the containers, but now, after nearly a year, most of them are still in use and still going strong."

Mr. Stryker says that the wooden boxes of similar dimensions which were formerly used were considerably heavier, required annual maintenance and represented ten times as much in initial investment per unit as the corrugated containers. He estimates that the lighter weight of the corrugated containers has enabled the company to effect savings of between 40 and 50% in tare weight charges on the shipments to Trenton.

KAISER: 2. Hopper bottom containers

WESTINGHOUSE: 2. Hinged gate for discharge

WESTINGHOUSE: 1. Production-line receptacles, shippers

Packaging/Packing & Shipping Room Ideas

A MONTHLY REVIEW

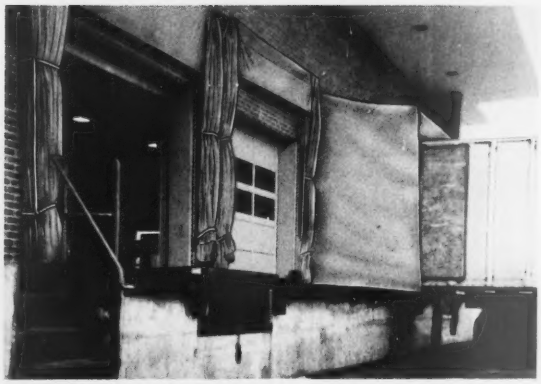
What do your customers think of your packages? In a lot of companies, it's become a routine practice to enclose a business reply card or questionnaire with each shipment asking the receiver to state the time of arrival and condition of the load and the individual packages in the shipment. While this is particularly valuable in supporting claims and in damage prevention programs, it's also good customer relations, as more than one company has found out.

Carrying this a little further, your questionnaire might be expanded to cover adaptability of your packages or containers to the receiver's handling system, storage needs or production line. It goes without saying that you can't keep everybody happy, but you can learn a lot and the mere fact that you're interested in your customer's problems from his point of view can make a lot of difference in a highly competitive sales situation.

Some companies of course send teams of packaging, handling and traffic men to their customers' plants to work out mutually compatible systems. Whatever level you tackle the problem at, however, your efforts will be all for the good.

(You may secure additional information about these recently-announced items of material handling equipment by circling the key number, indicated in parentheses after each item, on the "Distribution Data" business reply card in this issue.)

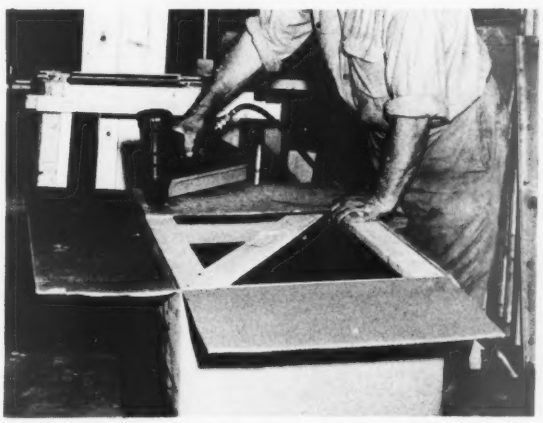
Retractable dock-door shelters from Dazzo Products, Inc., help overcome workers' complaints about bad weather, protect against slippery floors and product damage, says manufacturer. (No. 156) *Protective corners* molded of expanded polystyrene are



RETRACTABLE DOCK DOOR SHELTER

PROTECTIVE CORNER

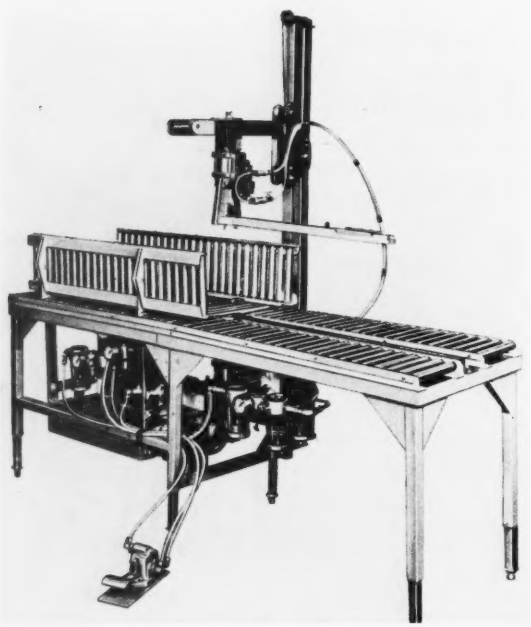
said by the manufacturer, Polyspand, Inc., to provide exceptional cushioning properties at low cost for packing and shipping furniture, typewriters, machinery and electronic instruments. (No. 157) *"20 Tested Methods* to Improve Packing and Shipping Operations" is title of booklet available from Better Packages, Inc. 16-page illustrated booklet contains tips and suggestions on safety, savings, product protection and proper maintenance of equipment. (No.



STAPLE NAILER

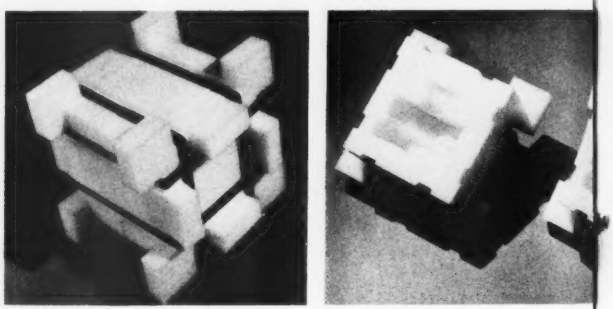
158) *Staple Nailer* developed by Fastener Corp. drives 1" wide crown staples from 21/32" to 1¾"

long, and is especially suited for industrial packaging work where corrugated box material is secured to wood, says manufacturer, because it eliminates need for nail/washer type of fastening. (No. 159) *Aluminum pallet* for assembly by the user has been developed by Brooks & Perkins, Inc., takes 2000-lb. load and can be assembled by one man with a wrench.



TOP-AND-BOTTOM STAPLER

Sizes range from 36 x 36" to 48 x 48". (No. 160) *Top-and-bottom stapler* which staples tops and bottoms, simultaneously, of center slotted corrugated and fibreboard boxes after they have been packed is announced by Container Stapling Corp. Unit is equipped with 2 stapling heads and is air operated with fully pneumatic controls, requiring no electrical connections. (No. 161) *Conduit and tube bundler* introduced by Remmele Engineering, Inc., is designed to wrap pressure-sensitive tape around a wide variety of rigid or thin wall conduit, steel and copper tubing, and numerous other long, slender objects. Machine operates at speeds up to 6 bundles per minute, says company, and it can be controlled by the turn of a dial to meter out the desired number of tubes automatically and arrange them in the shape desired for a specific packaging, shipping or material handling operation. Arranging is done simultaneously and automatically, and selected bundle shape is maintained throughout the taping cycle. (No. 162) *Re-usable complex pack* utilizing an expanded foamed plastic has been announced by Pac-Tron, Inc., which says pack was designed to offer maximum protection to delicate optical and electronic items against shock damage. Pack is custom-made, is shipped in conventional shipping container, and distributes shock loads equally to all 6 sides of container. It can be fabricated in various shapes and sizes to "capture" irregular shapes. (No. 163)



RE-USABLE COMPLEX PACK

DISTRIBUTION MANAGEMENT TIPS

(Continued from page 7)

Garbling of voice communications can cause its problems, too, and an industrial intercom system especially designed for high noise areas has been introduced by Atkinson Dynamics. The weatherproof units house both transmitter and receiver, are connected with ordinary 2-wire electric cord and are plugged into power line, generator set or batteries. (No. 167, Distribution Data Card.)

A final word on communications for those who have to make charts and presentations for meetings or training purposes but don't have the services of an art staff comes from Duchart, Inc., which offers a kit for making bar, pie, line and other types of charts of almost any size. Materials include pre-ruled backboards on which charts are built, and bars and pies of special paper with scales printed on the back to permit cutting to proper size. Self-adhesive tabs have dotted or solid lines, and others carry index years, months, figures and symbols. (No. 168, Distribution Data Card.)

Announcing the publication of –

"Essays On Physical Distribution Management"

by Edward W. Smykay
Associate Professor of Business Administration
Michigan State University

Tremendous savings are possible through an analysis and application of physical distribution principles. An explanation of the methods to employ to realize these savings is presented by an outstanding authority on the subject. Dr. Smykay's book is oriented toward solving problems in areas of transportation, traffic management, inventory control, organization, plant location, cost analysis, research procedures, and the computer.

Contributions to this series of nine essays have been made by: Dr. Donald J. Bowersox, assistant director of business development, REA Express; Ross Jones, vice president – distribution, H. J. Heinz Co.; and Dr. E. G. Plowman, vice president – traffic, United States Steel Corp.

Copies may be obtained by writing the Book Dept., T&DM-Transportation & Distribution Management, 815 Washington Bldg., Washington 5, D. C. Price: $3.75 per copy, discounts quoted for quantities of 10 or more. Size: 100 pp., paper covers, illustrated with 35 diagrams, charts, tables.